

THE INDUSTRY'S RECOGNIZED AUTHORITY

# ROCK PRODUCTS

CEMENT • SAND AND GRAVEL • CRUSHED STONE • SLAG • LIME • GYPSUM  
READY MIXED CONCRETE • CONCRETE PRODUCTS • INDUSTRIAL MINERALS

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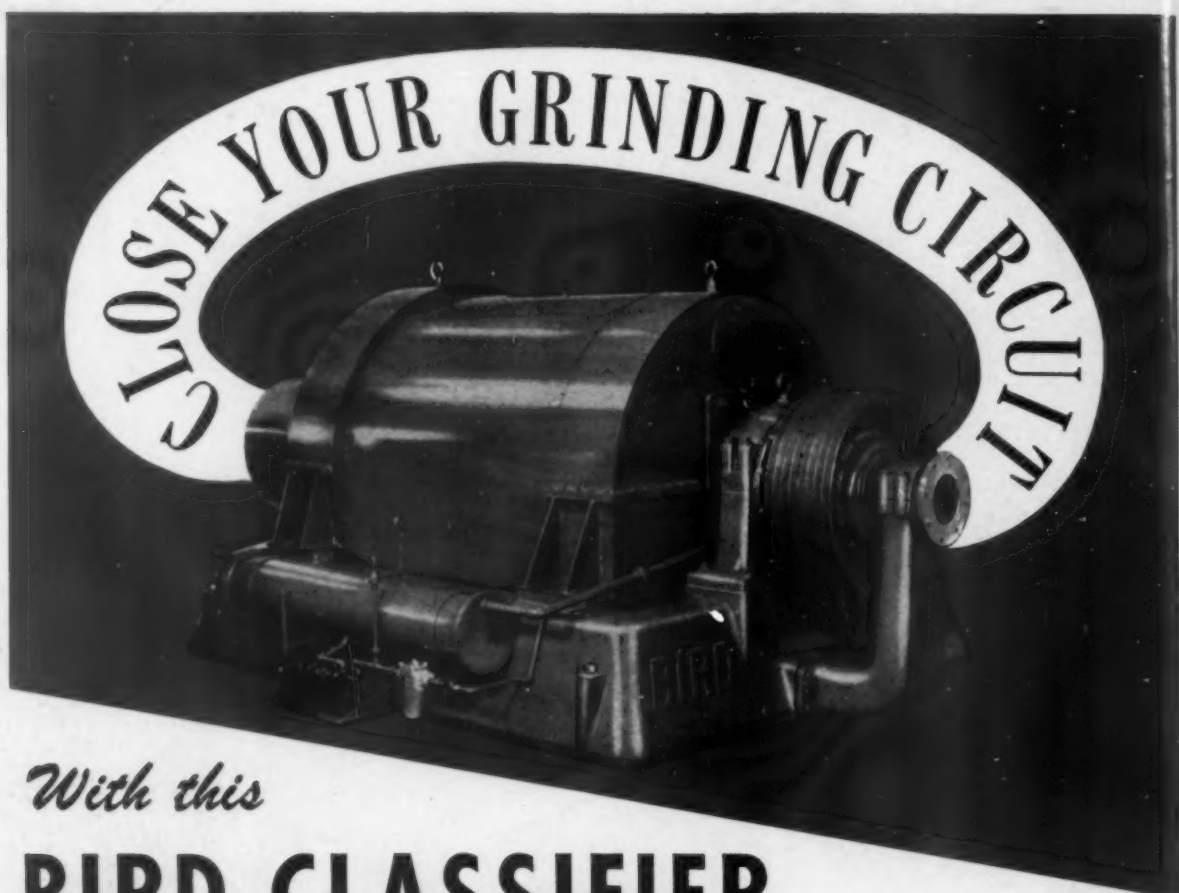
**APRIL, 1945**

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IPR

**AG STONE IS BIG BUSINESS**

APR 19 1945



*With this*

## **BIRD CLASSIFIER**

**... and you burn a better product  
and more of it at lower cost**

Put this BIRD Continuous Centrifugal Classifier in your grinding circuit and what happens?

Slurry is handled at tube mill consistency with the clay already added, if desired.

Fines are delivered at milling consistency. No thickening is necessary. They're exactly right for burning.

Oversize is returned for regrinding and this is so clean that grinding efficiency is increased and mill capacity is kept at maximum.

One small BIRD does the job. It fits neatly into your existing system, costs little to install, operate and maintain.

This is something you ought to look into, now, before you're swamped with rush orders. Get in touch with

**BIRD MACHINE COMPANY**  
SOUTH WALPOLE • MASSACHUSETTS

**BUILDERS OF BIRD CONTINUOUS CENTRIFUGAL FILTERS**





## How to keep an office building from jumping around

*A typical example of B. F. Goodrich development in rubber*

TENANTS howled when they heard an industrial laboratory was going into their office building. They knew the nerve-shattering noise and vibration a big 3-ton press would make.

But the company had to have its laboratory close to its offices for quick action in its vital war work. Comfort for 200 tenants, or convenience for one? They got both—because the trouble was anticipated.

The company had had experience in its factory with Vibro-insulators—a pre-war B. F. Goodrich development. Vibro-insulators are used to support

even heavy industrial machines as if they are hanging or floating on rubber. In factories they keep vibration from passing through floors and walls; and with vibration gone most noise goes too. Hundreds of thousands of them are in use right now in delicate electronic devices to prevent vibration from getting inside and causing harm.

The big press was mounted on a number of these B. F. Goodrich Vibro-insulators. (You can see them in the picture taken before the press was installed.) It has been operating for months and the other tenants

have yet to hear their first sound, yet to feel their first shiver.

B. F. Goodrich Vibro-insulators are conquering noise and destructive vibration in almost every place that vibration needs to be stopped. Vibro-insulators are another example of B. F. Goodrich research which is constantly improving both rubber and its applications, to make better and longer-lasting rubber goods for industry. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

**B. F. Goodrich**  
RUBBER and SYNTHETIC products



... is a "natural" for meeting today's demands for high-speed, low-cost methods of handling rock products and other bulk materials.

One Load Lugger hoisting unit, mounted on a truck chassis and operating with 5 to 10 or more Brooks detachable buckets, can do the work of several ordinary trucks, because hauling is continuous. No waiting for load-ups ... saves trucks ... conserves manpower ... reduces maintenance.

Use the Brooks Load Lugger System for quarrying operations, stripping overburden, feeding rock crushers, loading riprap on cars, road building, snow removal, ash disposal and other hauling jobs.

Write for Bulletins

**BROOKS EQUIPMENT and MANUFACTURING CO.**  
404 Davenport Road, Knoxville 8, Tenn.  
Distributors in All Principal Cities

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# SMOOTH AS OIL!



No shock—no stall—  
no loafing—with  
**FLUID-DRIVE  
LORAIN 82!**

**Y**OU can tackle a mountain of rock—or any other tough job—with a Lorain 82 and get the most out of every work-minute! These husky shovels are equipped with a life-saving, shock-absorbing hydraulic coupling that smooths out heaviest digging shocks and keeps the engine pulling at peak power under toughest loads. You just can't stall the engine!

No matter how big the rock or how tight it's lodged, the Lorain 82 hangs on until it's in the dipper. Sudden jerks, impacts and other shocks are cushioned by the spinning oil clutch—eliminating stress and strain on mechanism and cables and greatly lessening operator fatigue.

Combine this life-prolonging feature with Lorain center-drive direct-to-the-point power application, two-speed chain drive crawler, all-steel all-welded boom, all-steel dipper stick and new, streamlined dipper and you've got the ideal rock shovel—the Lorain 82!

If you want shovel performance that's literally "smooth as oil" and new, low per-yard handling costs, write for complete data on the shockproofed shovel.



Power for the Lorain 82 flows through this hydraulic coupling. Shocks impacts and sudden strains on the mechanism and cables are cushioned and absorbed by the fluid connection.

Reg. Trade Mark  
**thew Lorain**

THE  
THEW SHOVEL COMPANY  
LORAIN, OHIO

**CRANES • SHOVELS • DRAGLINES • MOTO-CRANES**

# One way to Produce more Limestone- Swing to TIMKEN ROCK BITS

A number of large limestone producers have proved that the use of Timken Rock Bits is an important factor of increased output due to faster drilling; ease of changing bits; reduction of bit and steel breakage. These operators are in better position to still further boost their production in accordance with the Government's request that the industry produce at least 15,000,000 tons of limestone this year—6,000,000 tons more than last year.

The writer of the letter reproduced here might have set out to express the experience of all Timken Rock Bit users, so typical is it of the results obtained wherever Timken Bits have replaced forged steels. If you are not using Timken Bits, *now* is the time to stage a test under your particular operating conditions. We'll help. The Timken Roller Bearing Company, Canton 6, Ohio.

The Timken Roller Bearing Co.,  
Canton, Ohio.

Gentlemen:

You may be interested in knowing that we have used Timken Rock Bits exclusively for the past four years, with a decided saving in expense, both in bit consumption and time, due to their evident superior construction and material.

Daily production is 5,000 tons of various size crushed stone aggregate used in construction activities at Fort Knox, Kentucky.

In that the shoulder design of the Timken Bit takes the shock of the hammer stroke, we have no trouble in removing used bits from the drill steel, thus eliminating trouble previously experienced.

In conclusion will say that a general saving has been noticed throughout the operation such as air consumption, steel breakage, bit breakage and have increased our production considerably without any noticeable increase in bit consumption.

Yours very truly,

*Taylor E. Huff*  
Taylor E. Huff  
Chief Operations Eng.,  
& Supt. Quarry Operations.  
Fort Knox, Kentucky.



THIS ADVERTISEMENT ORIGINALLY APPEARED IN APRIL, 1944





# For Smooth Running and FULL POWER!

**S**ELF aligning ball and roller bearings on all high speed shafts were first made a part of shovel design by Northwest and have always been standard equipment on Northwest Shovels, Cranes and Draglines.

In Northwest design lies the assurance of the minimum in friction losses and the maximum delivery of power to the dipper lip. This is only one of the many advantages that Northwest has pioneered and developed to the highest stage of efficiency—another reason why Northwest is a real Rock Shovel.

**NORTHWEST ENGINEERING COMPANY**  
1806 Steger Bldg., 28 E. Jackson Blvd.  
Chicago 4, Illinois

Quick shovel information for the man that O.K.'s the purchase of shovels.

.... If it's a  
real Rock Shovel  
you won't have  
to worry about  
output in dirt!



# NORTHWEST

# STOODY SELF-HARDENING Resists Power Shovel Abrasion

**P**OWER SHOVEL BUCKETS lifting tons of abrasive material per day receive tough treatment. Even manganese steel construction can't take the wear forever. But slap a few beads of Stooddy Self-Hardening on that bucket bottom—on lips, runners and teeth—and watch your wear troubles disappear! It doesn't require a lot of Stooddy Self-Hardening to turn the trick—a few pounds applied as stringer beads and spaced 1½" apart give excellent protection—almost as good as solid deposits—with a 75% saving in hard metal. And on bucket teeth the stringers are better than solid deposits; new applications can be made on all parts as often as required.

Stooddy Self-Hardening is your best bet for hard-facing all shovel parts because it provides maximum wear resistance with high impact values, bonds strongly with manganese steel—won't chip or spall and is easy to use. Applied electrically, deposits of ¼" bare Stooddy Self-Hardening can be welded ¾" thick in a single pass—providing a deep, solid, wear-resistant layer of hard metal with half the work and half the time normally required. And use of Stooddy Self-Hardening is not restricted to bucket parts alone—it's equally successful and economical when protecting track pads, idlers, drive tumblers and track rollers.

## STOODY COMPANY

1129 WEST SLAUSON AVE., WHITTIER, CALIFORNIA

Distributed in Canada by:

G. D. PETERS & CO., LTD., Montreal & Toronto

GORDON & BELYEA, LTD., Vancouver, B. C.

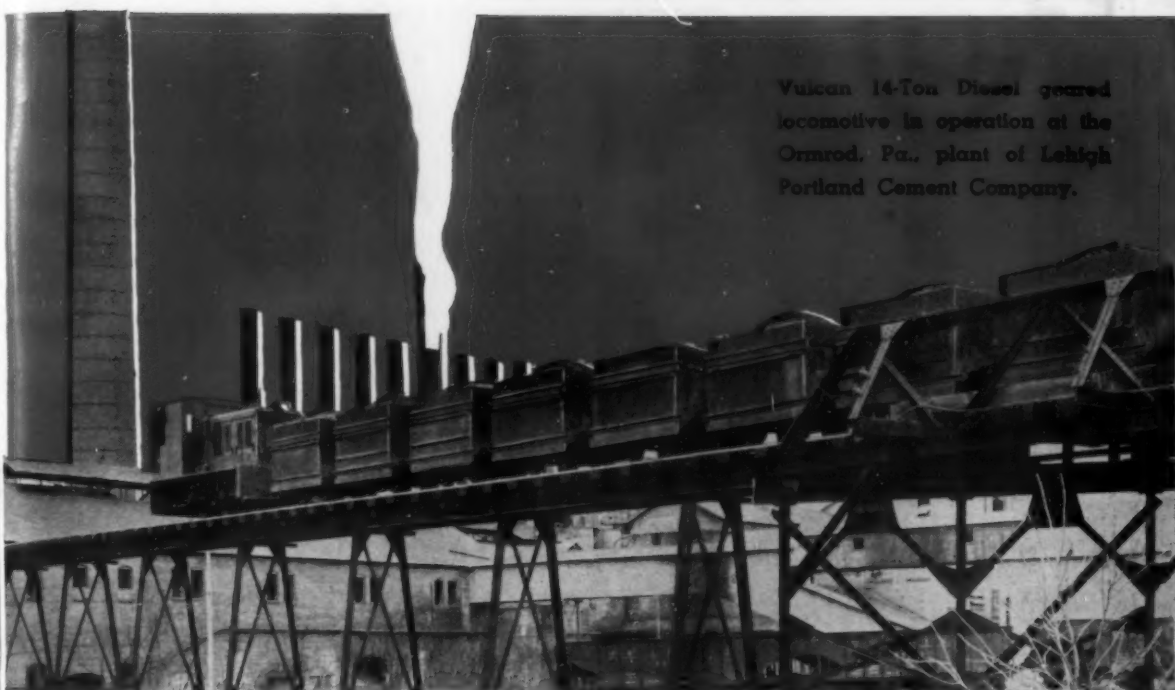
### Why Not Make This Trial?

Order a hundred pounds of Stooddy Self-Hardening today—it costs only 50c per lb. anywhere in the U. S.—and put it to work saving hundreds of dollars in shovel downtime, replacements and repairs. We know you'll be satisfied and pleased with your discovery!

## STOODY HARD-FACING ALLOYS

*Retard wear... Save Repair*

Vulcan 14-Ton Diesel geared locomotive in operation at the Osmrod, Pa., plant of Lehigh Portland Cement Company.

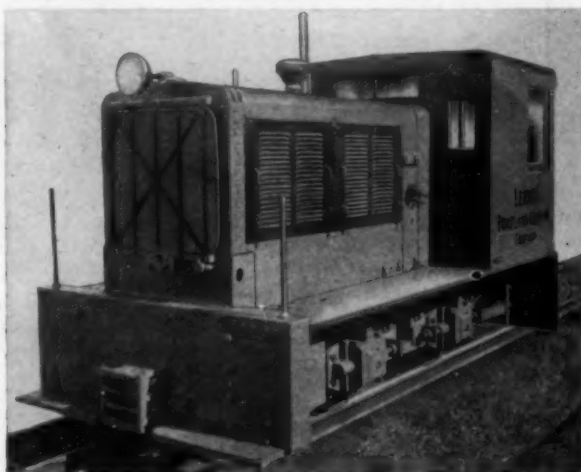


## Eight Years of Money-Saving Service and still "As Good as NEW"

Since July 1937 this sturdy Vulcan locomotive has been hauling ten-car trains of heavy rock from crushing plant to grinding mill—averaging 250 cars per 8-hour day over a three-quarter-mile round trip; with a maximum grade against the load of approximately one percent. And for all practical purposes, it's still as good as new.

Much of the credit for this money-saving record must go to the competent executives who have been responsible for its operation and maintenance, but back of it all are the ample margins of strength and power for which Vulcan locomotives have always been noted and which have made them the choice of many other great industrial organizations for over half a century.

More and better Vulcan locomotives are being built today than ever before—steam, gasoline, Diesel and Diesel-Electric—from 6 to 100 tons in weight—wide or narrow gauge. Deliveries are still subject to approval of the War Production Board but inquiries are cordially invited and will be given the fullest possible benefit of whatever priority can be secured.



Close-up of 14-Ton Vulcan locomotive shown in operation above. Equipped with 6-cylinder Caterpillar Diesel engine rated 145 hp. at 1000 r.p.m. and Constant-Mesh Four-Speed Spur-Gear Transmission which not only facilitates speed-changing but also eliminates all possibility of gear-stripping.

## VULCAN IRON WORKS

Established 1849

Main Office and Works **WILKES-BARRE, PA.,** New York Office 50 Church

Steam Locomotives	Rotary Kilns, Coolers and Dryers	Toothed, Double-Roll Crushers	Heavy-Duty Electric Hoists
Diesel and Gasoline Locomotives	Rotary Retorts, Calciners, Etc.	Heavy-Duty Briquetting Machines	Self-Contained Electric Hoists
Diesel-Electric Locomotives	Improved Vertical Lime Kilns	Ball, Rod and Tube Mills	Scraper-Loading Hoists
Electric Locomotives and Larrys	Automatic Quick-Lime Hydrators	Shaking-Chute and Chain Conveyors	Cast-Steel Sheaves and Gears



Body with open or scoop end  
(Right) Same body elevated.

# X-112 BODIES

*and*

# T-4440 HOISTS

*for*

# OPEN PIT MINING



Body with automatic  
downfold tailgate.

Fleets of Trucks, equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists, are hauling the biggest loads ever moved by trucks on production schedules. Lower mining costs have been made possible by speeding up the handling of overburden, ore and coal.

## SPECIFICATIONS

**HOIST**—Hydraulic, twin cylinder, telescopic.

**PUMP**—Gear type with aluminum wearplates.

**POWER-TAKEOFF**—2-gear single speed.

**BODY**—Heavy duty with pressed-steel, box-type side braces and cross members.

**BODY SHELL**— $\frac{1}{4}$ " sheet steel with 2" wood filler.

**WEARPLATE**— $\frac{1}{4}$ " with floor angles or  $\frac{3}{16}$ " without. Longitudinals 8-inch "H" beams.

**CAB SHIELD**— $\frac{1}{4}$ " plate.

**FLOOR ANGLES**—Optional.



Automatic gate  
opens as body  
elevates.



## GAR WOOD INDUSTRIES, Inc., Detroit 11, Michigan

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT



# HIGHEST POWER- LOAD CAPACITY

ever built into a  
transmission belt

On heavy-duty generators, compressors and other high-tension drives no belt can equal Goodyear's new **COMPASS** Steel Cable transmission belt in power-load capacity.

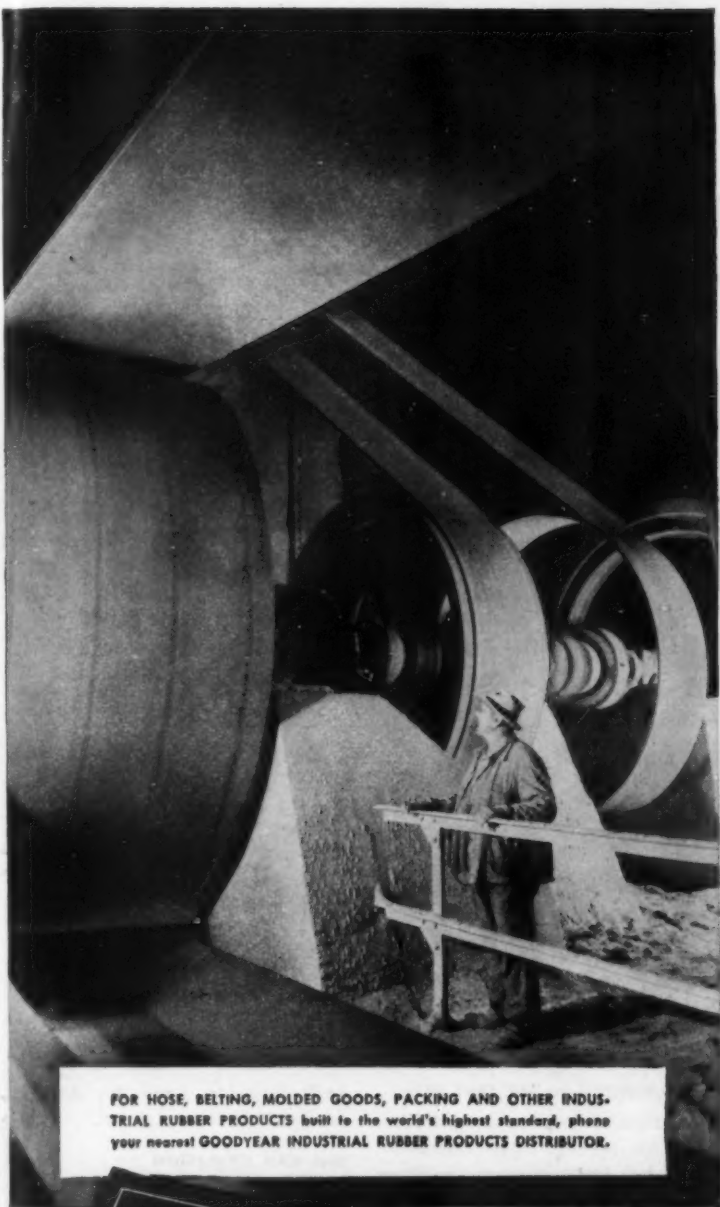
Built on the time-proved **COMPASS** principle—but sinewed with endless multiple-strand steel cables in place of cotton cord — this new belt is by far the strongest ever developed for service on "killer" drives. It withstands greater shock loads and higher tensions; has a longer flex-life than any multiple-ply, fabric-bodied belt — and is truly stretchless.

This means troublefree performance on belt-eating drives. It means you can handle higher peak loads, greater overloads without constant take-ups. And it means new equipment can be set up more compactly on shorter centers. Only Goodyear can offer such a belt because the **COMPASS** principle is patented by Goodyear, and because Goodyear has the longest successful experience in building steel cable belts.

For complete information on this new Goodyear "first," consult the G.T.M. — Goodyear Technical Man — or write Goodyear, Akron 16, Ohio, or Los Angeles 54, California, or phone your nearest Goodyear Industrial Rubber Products Distributor.

**P. S.** Specify Goodyear  
Compass Cotton Cord belts for  
regular-duty drives.

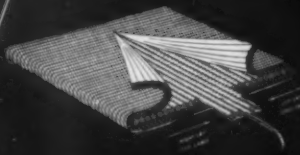
Compass—T.M. The Goodyear Tire & Rubber Company



FOR HOSE, BELTING, MOLDED GOODS, PACKING AND OTHER INDUSTRIAL RUBBER PRODUCTS built to the world's highest standard, phone your nearest GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR.



GOODYEAR INDUSTRIAL RUBBER PRODUCTS  
Specified **COMPASS** STEEL CABLE TRANSMISSION BELT  
for Heavy Duty Drives

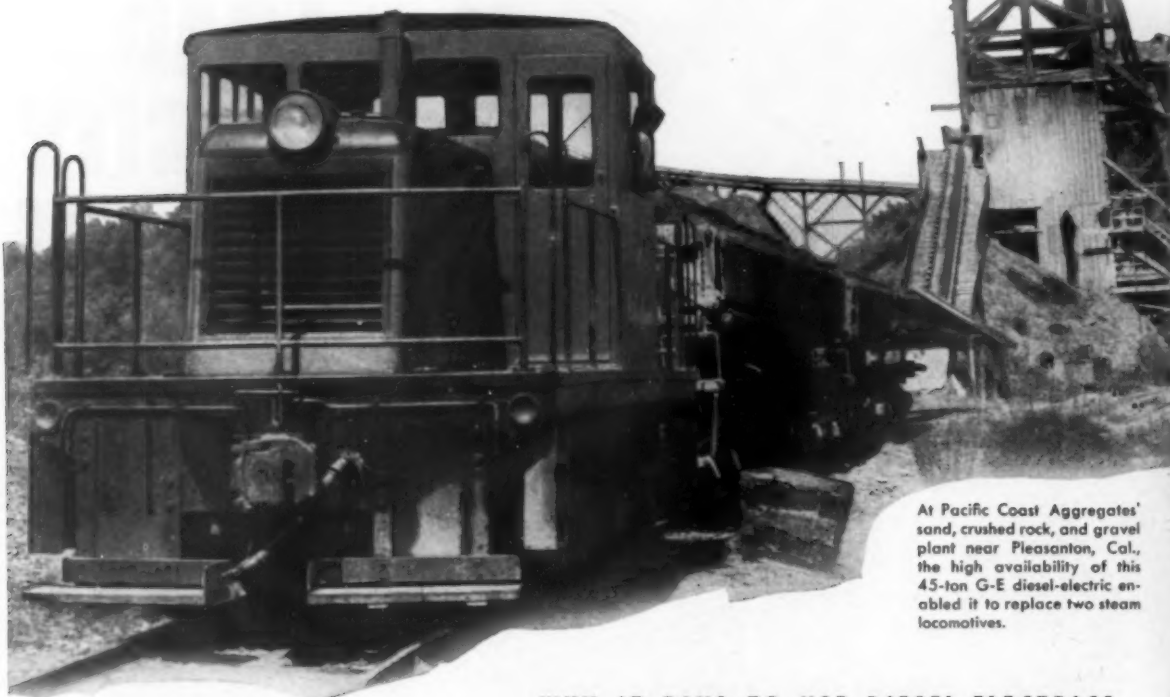


The Goodyear Compass Steel Cable belt is bodied with multiple-strand airplane-type cable spiralled continuously without a splice. Cable on opposing sides of belt axis is twisted in opposite directions to insure true running.



**GOODYEAR**  
THE GREATEST NAME IN RUBBER

# G-E diesel-electric work of two steam



At Pacific Coast Aggregates' sand, crushed rock, and gravel plant near Pleasanton, Cal., the high availability of this 45-ton G-E diesel-electric enabled it to replace two steam locomotives.

## WHY IT PAYS TO USE DIESEL-ELECTRICS

### AVAILABILITY—90 PER CENT UP!

The diesel-electric carries sufficient fuel for several days' operation, runs for long intervals between overhauls, and requires only periodic inspections.

### ALWAYS READY TO GO

The diesel-electric starts on the press of a button. No unproductive labor time is required to get the locomotive ready for work.

### FUEL COSTS LOW

The diesel-electric's high efficiency allows it to operate on a fuel cost that is only a fraction of that of a steam locomotive. Moreover, you

don't have to keep the engine running to "keep up steam."

### ONE-MAN OPERATION

The diesel-electric needs only a one-man crew, as against two usually required on a steam locomotive.

### MAINTENANCE SIMPLIFIED

The diesel-electric has no boiler, firebox, nor heavy reciprocating parts, thus greatly simplifying maintenance.

### A HIGH-RETURN INVESTMENT

Cost records show that G-E diesel-electrics often return 20 to 30 per cent annually.



**diesel-electric**  
**INDUSTRIAL**  
**LOCOMOTIVES**



# at gravel plant does locomotives



Because of its almost continuous availability, this 45-ton G-E diesel-electric, at the Pleasanton, California, plant of Pacific Coast Aggregates, is able to do the work that previously required two steam locomotives.

The job is hauling sand and gravel a half mile from the pit to the crusher-classifier plant; spotting cars for the drag-line at the pits; and spotting cars over the dumps at the plant. In addition, railway gondolas are spotted for loading with cleaned, graded aggregates.

When the steamers were used, after every eight hours 30 to 40 minutes were required for refueling; once every 16 hours they needed 70 minutes to take water; and an additional two hours a day were necessary for steaming up in the morning and banking fires at night.

The diesel-electric starts on the press of a button, and refuels in ten minutes once in 60 hours.

Besides all this, the diesel-electric's maintenance costs are extremely low, despite the fact it operates for two 8-hour shifts a day. The little servicing that it requires is done during the lunch period.

The Pacific Coast Aggregates is well pleased with its operation and has standardized on G-E diesel-electric units. Two locomotives of the 25-ton class were ordered, one of which is now in operation. These replace either steam or gasoline-driven locomotives.

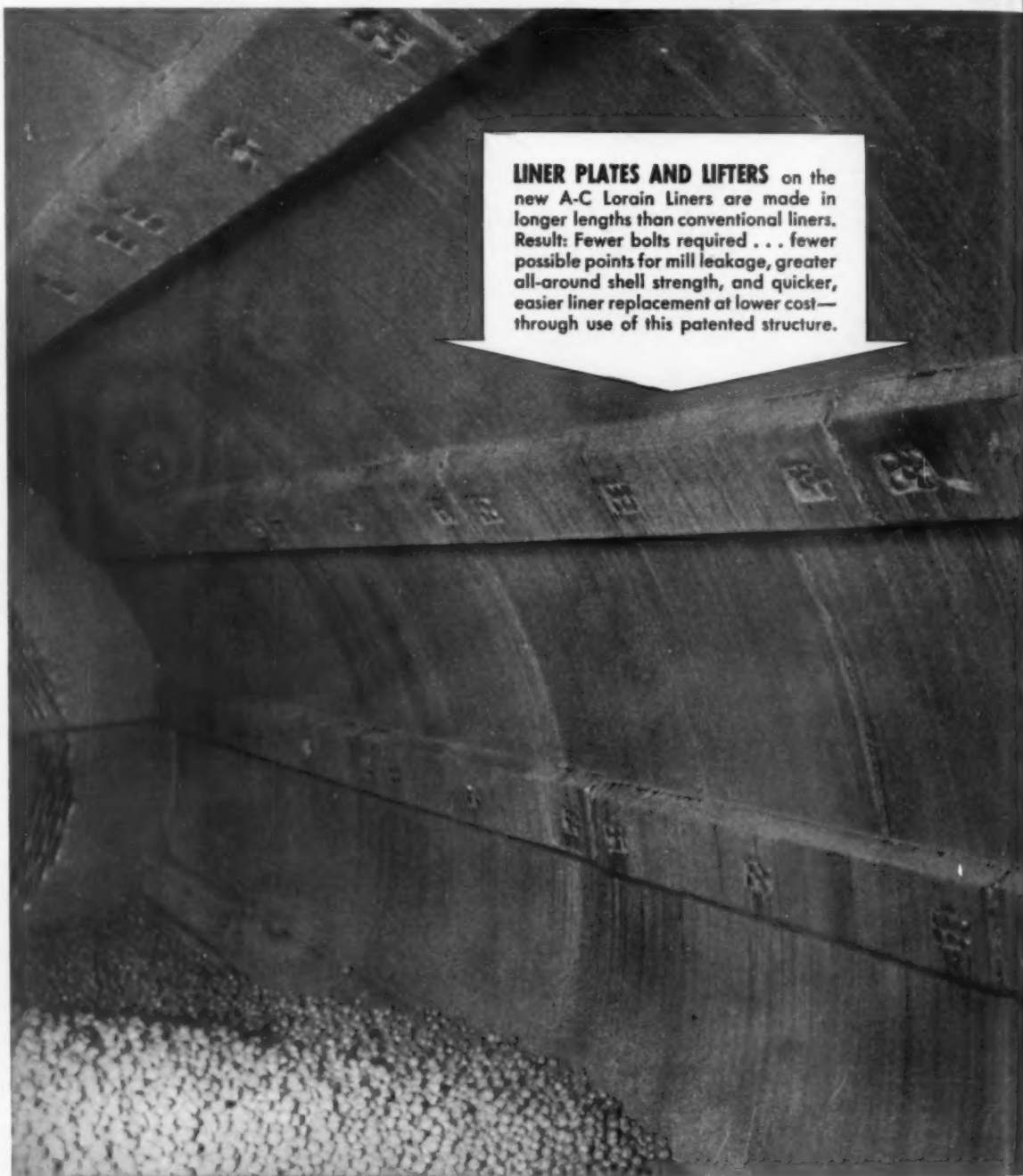
G-E diesel-electrics can do hauling and switching at substantial savings, and your G-E representative will gladly show you how they do it.

General Electric Company, Schenectady 5, New York

**GENERAL  ELECTRIC**

Buy all the BONDS you can—and keep all you buy

# PRODUCT OF THE MONTH.



**LINER PLATES AND LIFTERS** on the new A-C Lorain Liners are made in longer lengths than conventional liners. Result: Fewer bolts required . . . fewer possible points for mill leakage, greater all-around shell strength, and quicker, easier liner replacement at lower cost—through use of this patented structure.

**ALLIS**  **CHALMERS**



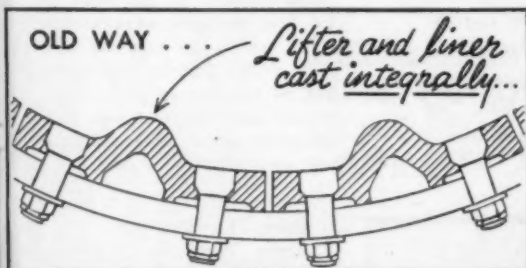
# H...A-C Lorain Liners

MILWAUKEE, WIS. — Allis-Chalmers announces the new A-C Lorain Liner, adaptable to *all* makes and diameters of new or old style cylindrical grinding mills.

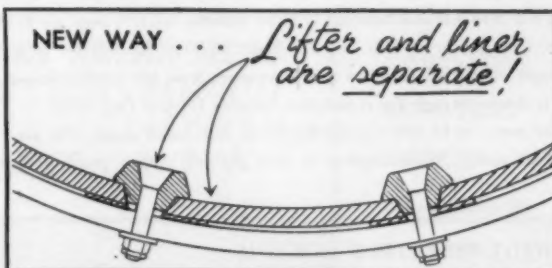
In contrast to conventional one-piece cast liners, new A-C Lorain Liners consist of *two* principal units: 1) high carbon rolled steel liner plates; 2) separate rolled alloy steel lifters. This construction enables lower initial and replacement cost of liners — reduces the grinding cost per ton of material handled.

An increase in lining diameter, resulting in greater mill capacity, is made possible by the use of thinner liner plates than those on conventional cast steel liners.

A-C Lorain Liners are now available in a complete range of liner plate thicknesses and lifter heights to fit any mill or application. Write today for Bulletin B6355.



**CONVENTIONAL LINERS**, of rib, wave, shiplap or wear type, are generally constructed of cast iron or cast alloy steel—*lifters cast integral with plates*. Two main disadvantages of this construction are: 1) Being cast, conventional liners are often thicker and heavier than required for many applications; 2) When lifters wear down or off, a *sliding* instead of *cascading* action of the grinding media results — reducing both grinding efficiency and capacity of the mill.

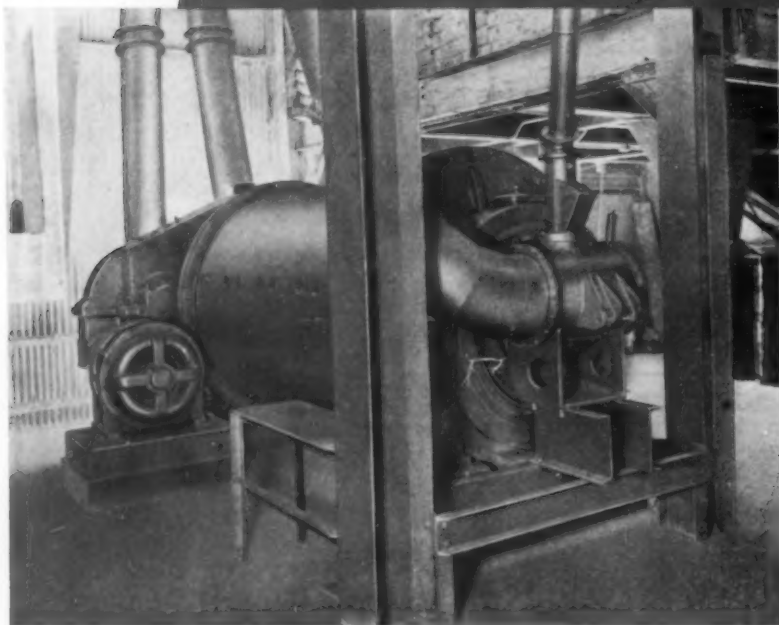


**LINER PLATES** on the A-C Lorain Liner are held in place by self-wedging lifters that bolt to shell. Lifters and liners are both reversible and renewable. For example, when one side of lifter is worn down, it may be reversed and other side used... *giving double the lifter life*. When both sides wear down, *only the lifter* need be renewed—thus eliminating unnecessary scrapping of body section of liner! It all adds up to greatly reduced liner cost... easy, quick maintenance... less down-time!

A 1815

RS MILWAUKEE, WIS.

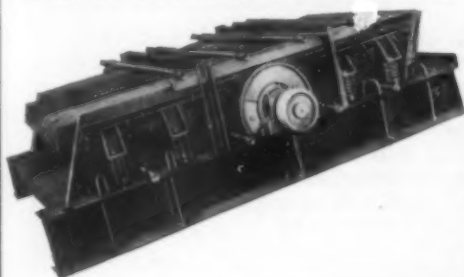
# Machinery for



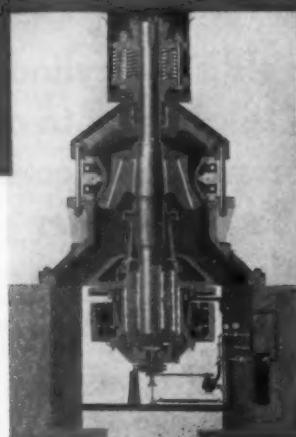
## THIS 5½' x 8' KENNEDY AIR SWEEPED TUBE MILL PRODUCES 7 TONS PER HOUR—With a feed of 4x¾ in. limestone and dust.

Use the Kennedy Air Swept Tube Mill to get superfine grinding at bottom costs. The product ground in this tube mill and collected in three cyclones is (1) 5 tons per hr of 80% thru 200 mesh, (2) 1 ton per hr of 92% thru 200 mesh, and (3) 400 lbs. per hr of 99.8% thru 325 mesh. Simple adjustment permits a desired variation from this combination of fine mesh sizes. The mill is driven through the remarkable Kennedy Integral Gear Drive for Tube Mills. This enables the motor to be direct-connected to the high speed shaft. The gears cannot be misaligned or set wrong. Power required to drive the mill is thus greatly reduced.

## KENNEDY VIBRATING SCREENS . . .



give positive action on the screen cloth without transmitting vibration to supporting members. They are made in a wide variety of sizes with single or double decks and to meet any screening requirements. The type of vibration used permits lower speeds for large pieces and higher speeds for small pieces. Material is continually turned over when passing along the screen surfaces. In this way, exceptionally high efficiency is obtained at all times.



## KENNEDY BALL BEARING GEARLESS CRUSHER . . .

With a Synchronous Motor built in its pulley, this machine shows 80% saving in the cost of maintenance and a saving of 50% in power over geared crushers. It has produced 156 tons per hour when set to 7/16" between the head and concaves at the bottom. The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system. The motor is built especially for this crusher.

## Burn The Smaller Sizes Too

### Kennedy Vertical Continuous Discharge Kiln

By calcining stone ranging ¾" to 1½", this kiln utilizes what would ordinarily be waste for the old type vertical kiln. Fuel is thermostatically controlled, making the kiln practically automatic. It discharges continuously, eliminating overburned or underburned lime.

If your lime market is too small to warrant a Preheater and Rotary Kiln installation you can produce a better grade of lime five to ten tons daily with the Kennedy Vertical Continuous Discharge Kiln. It has a lower power requirement, high thermal efficiency, and produces a quality product.

# KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

# AGRICULTURAL LIMESTONE and LIME MANUFACTURE...

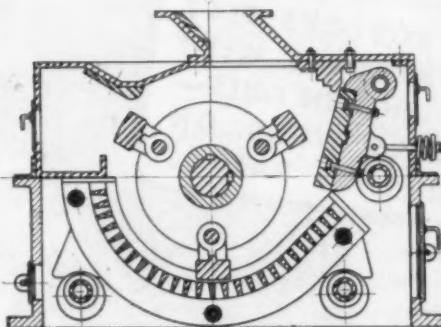
Kennedy Machinery can put your plant up among the leaders. It has been developed by more than 50 years in designing, manufacturing, and installing practically every type of machinery used in Rock Products plants. How the Kennedy line provides the latest in scientific lime and agricultural limestone production is shown in the Kennedy advancements described here. With Kennedy machinery you can have greatest confidence that your plant will maintain its high initial efficiency for years to come.

# KVS

Machinery and equipment for the complete lime or agricultural limestone plant incorporates the most efficient principles applied to each type of machine plus exclusive Kennedy refinements.

## The Best Hammermill Features

are built into Kennedy Roll Hammer Crushers. The Type "E" machine which is diagrammed at the right is equipped with from three to eight hammers, depending on the material to be pulverized. This machine is easy to adjust while in operation, by cam arrangements. The weight of the hammers depend largely upon the diameter of the machine and the material handled. Shafts are carried in ball bearings. Type "E" pulverizes from 75 to 500 tons per hour depending upon the size machine.



**THE LATEST IN SCIENTIFIC  
LIME PRODUCTION - KENNEDY  
STONE PREHEATER - ROTARY KILN  
DEHEATER AND SOAKING PIT**

**20% Increase in Capacity—40% Savings in Fuel**

It is now possible to combine the superior product of a rotary kiln with the operating economy of a vertical kiln with the Kennedy Stone Preheater and Deheater. By partial calcining the material this system reduces kiln wear and kiln lengths. It recovers and utilizes exit gases, and has proved so efficient in actual operation that 40% fuel savings and increased output exceeding 20% have been obtained.

Short kilns employing the Kennedy method also acquire an internal glaze which lessens the wear on kiln liners, lowers the power requirements, and reduces formation of kiln rings. Overburned and underburned lime is practically eliminated. Coal feed and lime calcination are switchboard controlled.

**KILNS  
COOLERS  
DRYERS  
CRUSHERS  
HAMMERMILLS  
SCREENS  
FEEDERS  
CONVEYORS  
ELEVATORS  
GRINDING MILLS  
CLASSIFIERS  
WASHERS  
DUST COLLECTORS  
AIR SEPARATORS**

*Write Today*

for our catalog and description on these and other types of KENNEDY machinery.

**2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.**



# JEFFREY - TRAYLOR ELECTRIC VIBRATING GRIZZLY FEEDER (PATENTED)



BY-PASSES FINES  
—AHEAD OF CRUSHERS  
—PROTECTS BELT  
CONVEYORS WITH  
CUSHION OF FINES—  
SAVES WEAR ON  
CRUSHER PARTS.

Sketch above shows how fines pass between the Grizzly bars direct to conveyor belt without going through crusher — thus forming a protective layer to cushion the jagged lumps which follow.

The electric vibrating principle keeps feed under instant and positive control. Large bin openings of the crusher will take cubes up to 24" and 30"

We will be glad to go into more detail.



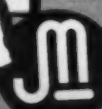
# THE JEFFREY

## MANUFACTURING COMPANY

935-99 North Fourth St., Columbus 16, Ohio

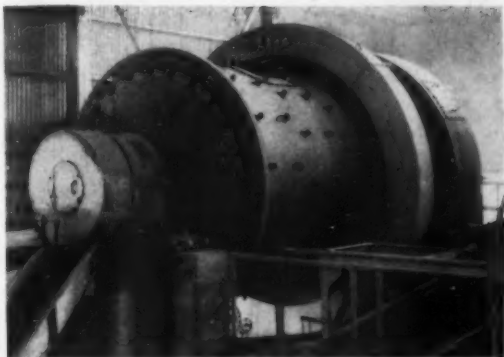
Baltimore 1	Buffalo 2	Cleveland 13	Harlem	Milwaukee 11	Pittsburgh 22
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ESTABLISHED  
1877



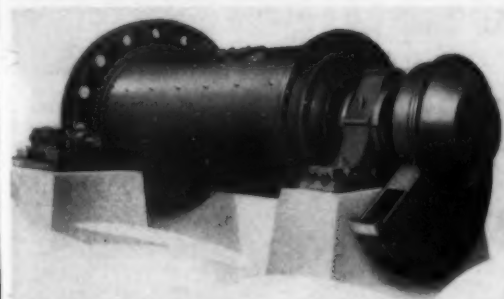


# CONFIDENCE AND SATISFACTION



... in the performance of Traylor Grinding Mills. That's why engineers have specified them, during the past twenty years and more, for new cement, lime, and process plants as well as for old plants undergoing expansion and modernization.

Whether your grinding needs call for a "coarse," "medium," "fine," or "extra fine" product, there is a Traylor Mill to give you the most satisfaction. Traylor Mills will deliver the quantity you need, of the exact character required at minimum unit cost and low maintenance expense.



Traylor is qualified and equipped to build Grinding Mills of standard types or specially designed to fit your needs.

Our technicians are available at any time. Write us for appointment or—

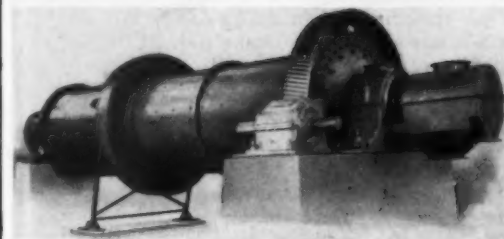
ASK FOR

## BULLETIN 2103

### WE BUILD

Rotary Kilns  
Rotary Coolers  
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Scrubbers  
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Jaw Crushers  
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Reduction Crushers  
Crushing Rolls

Grinding Mills  
Ball Mills  
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Wash Mills  
Feeders  
Rotary Screens  
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MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

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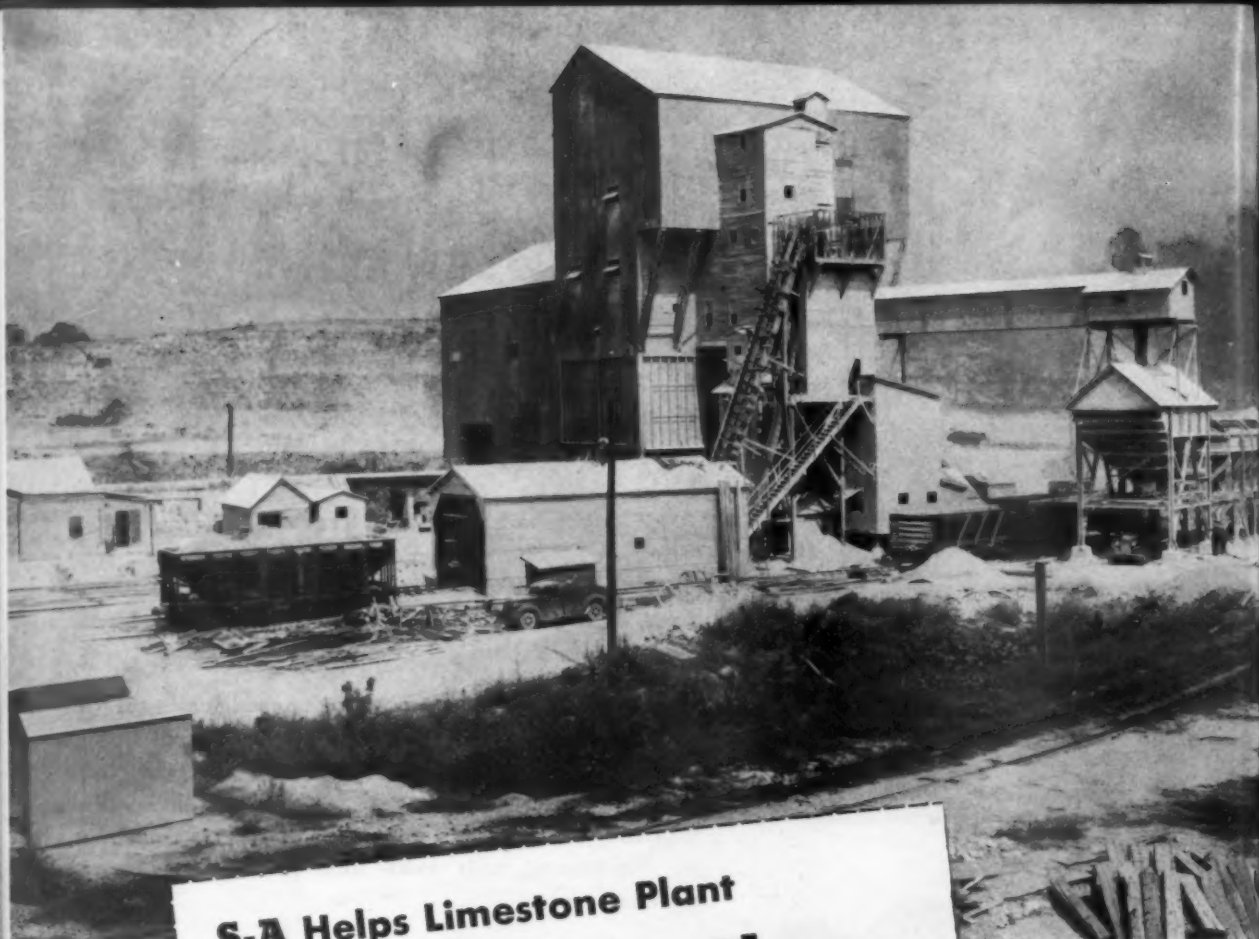
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## S-A Helps Limestone Plant Boost Production To Meet Huge Demand

The Columbia Quarry Krause plant in which all material handling equipment for the new expansion was furnished by Stephens-Adamson.

When greatly increased demand for agricultural limestone taxed the capacity of Columbia Quarry Company's plant at Krause, Illinois, the company decided to install new handling and pulverizing equipment. It is a matter of pride to Stephens-Adamson that it was among those called in to help design and install the necessary new machinery.

Helping rock producers expand their operations with efficient, designed-to-the-job

equipment is a familiar role to S-A engineers. It's a job they have been doing for the 43 years S-A has specialized in the development of better material handling methods and equipment.

When you plan to improve or expand your facilities, take advantage of this two-way S-A service: (1) the ability to design exactly the system you need for fast, low cost handling, using (2) the right equipment selected from the complete line of S-A manufactured handling units.

**STEPHEN S-ADAMSON**  
7 RIDGEWAY AVENUE, AURORA, ILLINOIS MFG. CO. LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

*Designers and Manufacturers of All Types of*  
**BULK MATERIAL HANDLING EQUIPMENT**

## WHEN "BIG BOY" TAKES OFF HIS UNIFORM



● All over the world, where the going is toughest, the M1A1 Army heavy wrecker has earned its reputation as the biggest, toughest, pullin'-est bruiser on wheels. These super trucks, built by Ward LaFrance Truck Division for the Ordnance Department, are used for such jobs as tank recovery, motor vehicle rescue, lifting and carrying disabled bombers. They operate in the mire of European swamps . . . the muck

of Asiatic jungles. To the M1A1 wrecker, a road is a convenience, rather than a necessity . . . In the near future, Ward LaFrance commercial trucks and tractors will again appear on America's highways. These Ward LaFrance over-the-road trucks and tractors are designed to haul pay loads faster and more economically than ever before. They are not streamlined like a sport coupe, but they look like what they are: the biggest, toughest, sturdiest motor trucks on the highway. They are backed by the twenty-five year Ward LaFrance reputation for building great trucks, further proved by unbeatable performance all over the world.

# WARD LAFRANCE

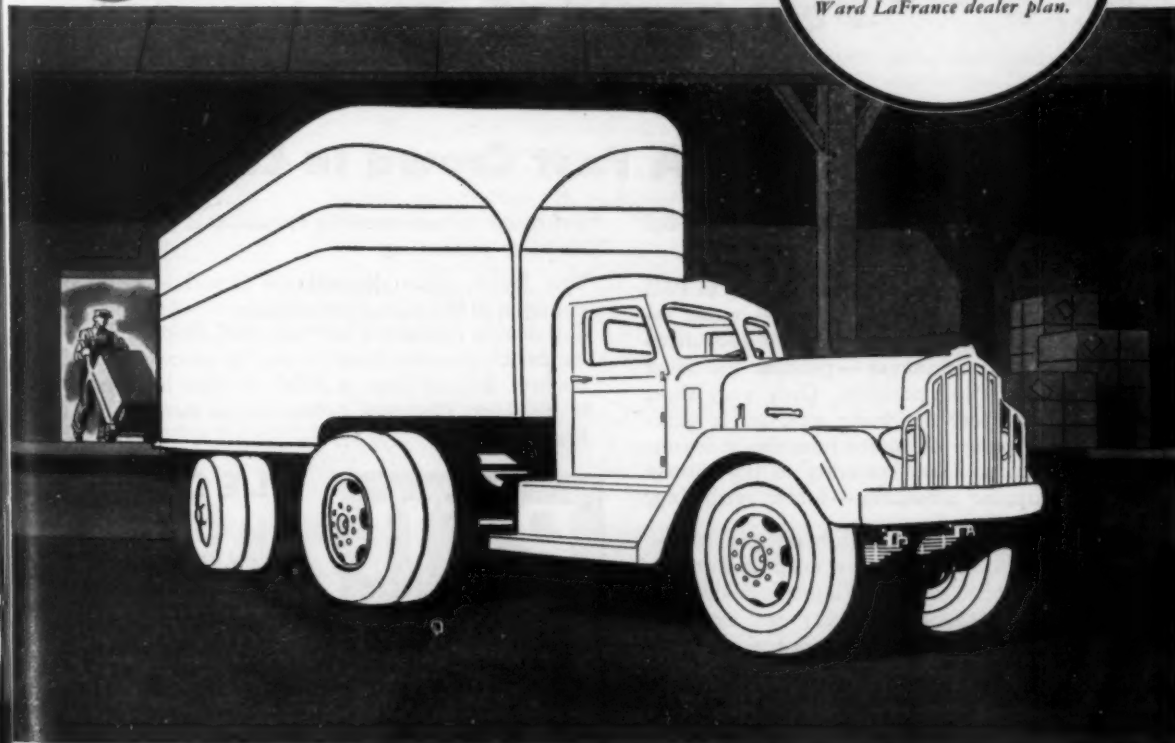
TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC.

ELMIRA • NEW YORK



FRANCHISES ARE AVAILABLE to alert dealers in a number of attractive territories. Leading dealers now handling smaller, non-competitive trucks will be especially interested in the Ward LaFrance dealer plan.







## How We Keep A Fast Crowd In Line

Here's a *fast crowd* that doesn't give trouble—not the way P&H builds it!

It's plain to see why the crowding action of P&H Electric Shovels is so much livelier—more responsive and powerful. Conical worm gear drive cuts inertia to a minimum—permits the most compact gearing unit possible. Only very short shafting is required; overhung gearing is eliminated. Every ounce of power from the independent crowd motor flows smoothly to the dipper sticks for *snappier crowding—faster retracting*.

P&H engineers increase the advantages of the compact, flood-lubricated gear case design by building it integral with the boom. Welded-in construction adds to boom rigidity and strength, while integral shipper shaft housing prevents bearing movement and torque on the boom. The

net result in any open-pit operation is bigger and steadier production.

This faster, more dependable crowd is another example of the advanced engineering and simplified design that mark the new P&H Electric Shovels as the greatest forward step in electric shovel history. Behind them is P&H's 60-year leadership in applying electrical power to the movement of heavy loads.

P&H

HARNISCHFEGER

CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

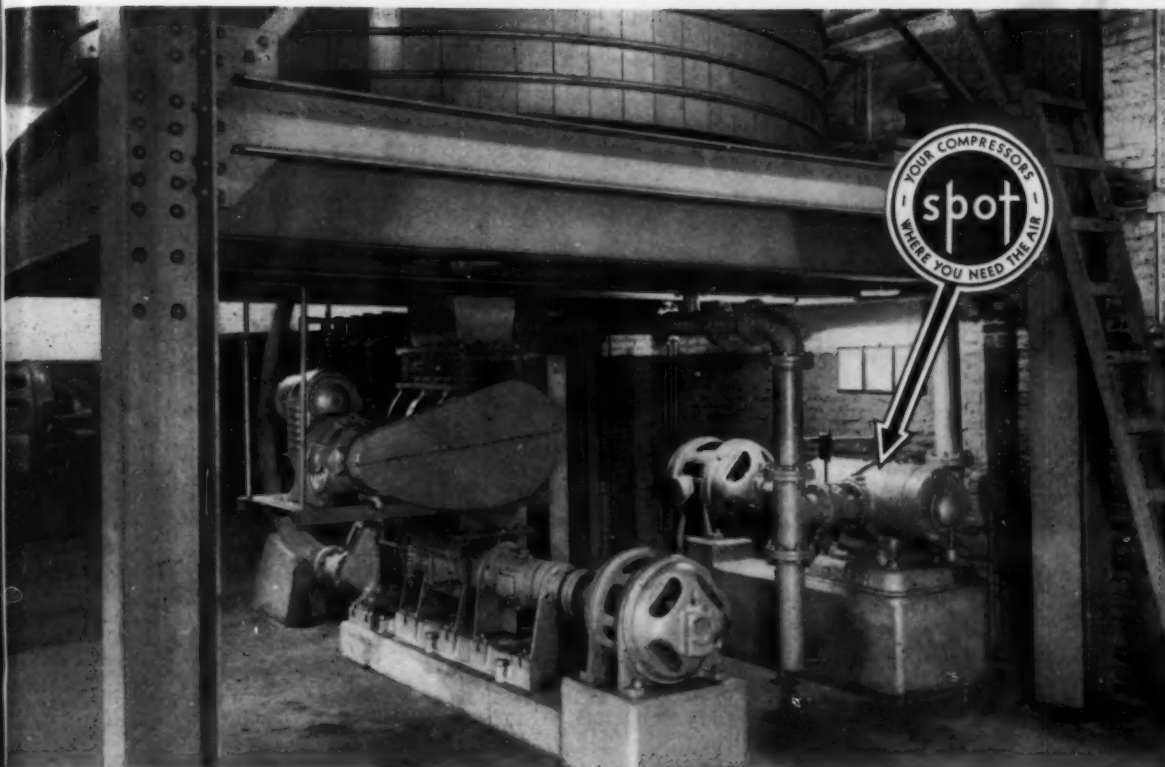
ELECTRIC  
SHOVELS

4465 W. National Avenue  
Milwaukee 14, Wisconsin

HOISTS • WELDING ELECTRODES • MOTORS

**THE GREATEST FORWARD STEP EVER MADE IN ELECTRIC SHOVEL DEVELOPMENT**





## Another Fuller Rotary Compressor *"spotted"* where they need the air



Write for Bulletin C-5, illustrating and describing Fuller Rotaries.

This Fuller Rotary Single-stage Compressor was installed by a producer of pulverized phosphate rock to supply air to the Fuller-Kinyon Pump for conveying material to a mixer bin.

Compressed air was available from a central compressor station but at a very much higher pressure than needed for this particular purpose. So rather than use air through a reducing valve with the attendant losses, it was decided to install a compressor to discharge directly to the pump. By this means the compressor develops the exact pressure required by the system, assuring maximum efficiency at all pumping conditions. This results in considerable saving in power, costly transmission lines with their attendant expense, friction losses and line leakage. In other words, a compressor "spotted" for air where and when needed and at pressures to do the work most economically and efficiently.

**FULLER COMPANY, CATASAUQUA, PA.**

Chicago 3 • 1144 Marquette Bldg.  
San Francisco 4 • 421 Chancery Bldg.  
Washington 5, D. C. • 618 Colorado Bldg.



FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS  
... ROTARY FEEDERS AND DISCHARGE GATES ... ROTARY AIR COMPRESSORS  
AND VACUUM PUMPS ... AIR-QUENCHING INCLINED-GRATE COOLERS ... DRY  
PULVERIZED-MATERIAL COOLER ... AERATION UNITS ... MATERIAL-LEVEL  
INDICATORS ... MOTION SAFETY SWITCH ... SLURRY VALVES ... SAMPLERS

C-116



**GETS THERE FASTER**

**SURE-FOOTED** . . . highly maneuverable, Gardner-Denver Wagon Drills are easy to move over the roughest ground. For quarries, highway or construction projects, their easy portability speeds drilling.



**SPOTS QUICKER**

**DOWN HOLES** . . . toe holes . . . clean holes . . . —for any type of drilling, the quickly adjustable Gardner-Denver Wagon Drills make hole spotting simple. "Hole spotter" at bottom of feed permits spotting without difficulty.

**EXCEPTIONAL** hole-cleaning ability . . . convenient control valve . . . fast, powerful drilling action . . . are other important advantages that make Gardner-Denver Wagon Drills preferred for so many drilling jobs. For complete information, write for descriptive bulletin. Gardner-Denver Company, Quincy, Illinois.



**GARDNER-DENVER** Since 1859



## Increase Agstone Production in the Fine Size Ranges

CLOSE-CIRCUIT YOUR SYSTEM  
with a

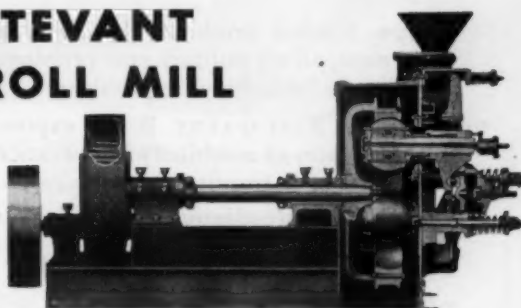
# STURTEVANT AIR SEPARATOR

**T**HE profit-wise producer of agricultural limestone and lime sees to it that he turns out sizes that are known to be most quickly absorbed into the soil once spread. This problem of product quality is most easily solved by utilizing the sizing efficiency of STURTEVANT Air Separators.

STURTEVANT Air Separators are tops in mechanical efficiency. They include such engineering features as (1) Range of fineness from 40 to 350 mesh, (2) Capacities of  $\frac{1}{4}$  ton to 50 tph, while increasing mill capacity as much as 300%, (3) Controlled specific surface area, (4) lowered mill and product temperatures, and (5) the only separator quickly adjustable to meet all requirements and specifications under all conditions.

## STURTEVANT RING-ROLL MILL

• The ideal mill for grinding agricultural limestone and lime. It efficiently crushes materials from 1" to  $1\frac{1}{4}$ " to any mesh between 6 and 200. It is easily adjustable to work at maximum efficiency. The rolls grind with absolutely equal and opposite pressures against the ring of from 20,000 to 60,000 lbs.



### CLOSED-CIRCUIT UNIT WITH RING-ROLL MILL AND AIR SEPARATOR

An integral unit arrangement of the ideal combination for producing agstone. Write today for our bulletin describing this Sturtevant equipment.

STURTEVANT MILL CO.  
HARRISON SQUARE BOSTON 22, MASS.

# STURTEVANT

AIR SEPARATORS • RING-ROLL MILLS • JAW CRUSHERS • CRUSHING ROLLS  
SWING SLEDGE MILLS • MOTO-VIBRO SCREENS • ROTARY FINE CRUSHERS



**RUST**—a nuisance and a very costly menace in many places no longer need be tolerated. Laboratory magic has furnished its master.

New Sinclair products, developed to solve tremendous military rust problems, are now available for your problem.

Sinclair **RUST-O-LENE B** for exposed metal surfaces of machinery in operation, in storage, or in transit

- provides a firmly-adhering rust proofing film
- prevents rusting of clean surfaces
- halts further rusting of corroded surfaces
- has lubricating qualities
- defies any degree of moisture from mere dampness to heavy rain
- can be readily removed when desired

Sinclair **OPALINE RP** (Rust Preventing) OILS for enclosed oil systems, prevent internal rusting of engines, hydraulic systems, gear reducers, and similar machinery intermittently operated, stored, or transported. **OPALINE RP** also has ample lubricating qualities for temporary use.

Both these remarkable Sinclair rust-preventives have successfully passed the most exacting service tests, and fully meet Government specifications.

Learn how **RUST-O-LENE B** and **OPALINE RP** can combat rust for you. Write for brochure giving full details.

# SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 430 FIFTH AVENUE, NEW YORK 20, N. Y.

Rust-O-Lene-Opaline Reg. U.S. Pat. Off.



# "Absolutely Tops!"

**SAYS OWNER McCABE**

**A**ND that's not all enthusiastic Lloyd McCabe said when asked what he thinks of the two "Caterpillar" Diesel D13000 Engines which run his limestone crusher and pulverizer located two miles from Pella, Iowa. Speaking of the older of the two, which in 3½ years has turned in 5692 hours under steady load, he expressed himself in this crisp fashion:

*"Have worked with contractors for 17 years and know all makes. You couldn't put anything else in this plant for me. Job is very dusty, but the oil filters and air cleaners are perfect. Good starting in cold weather. One morning at 30 degrees she started the second time over. Easy machine to put a green man on. Easy to take care of."*

Mr. McCabe also has a "Caterpillar" Diesel D7 Tractor with bulldozer and scraper; and a D4 that's Traxcavator-equipped. He's lucky—having all that "Caterpillar" Diesel equipment to keep him going during a period when new machines have been hard to get because of the war.

These rugged, dependable, economical and long-lived engines are especially armed to fight the "Battle of Grit and Dirt" that rages around a crushing plant. Through the features listed at the right, "Caterpillar" Diesels are **SEALED AT EVERY POINT** at which harmful substances might enter.

It will be good news to all of us when there will again be plenty of brand-new "Caterpillar" Diesels available. If you need one, your "Caterpillar" dealer will do everything he can to help you. See him soon.

**CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS**



- Large three-stage oil-bath air cleaner.
- Super-efficient absorbent type fuel filters.
- Combination absorbent and metal type oil filters.
- Completely enclosed valve-operating mechanism.
- Covers, oil pan, housings, etc. — all oil and dust tight.

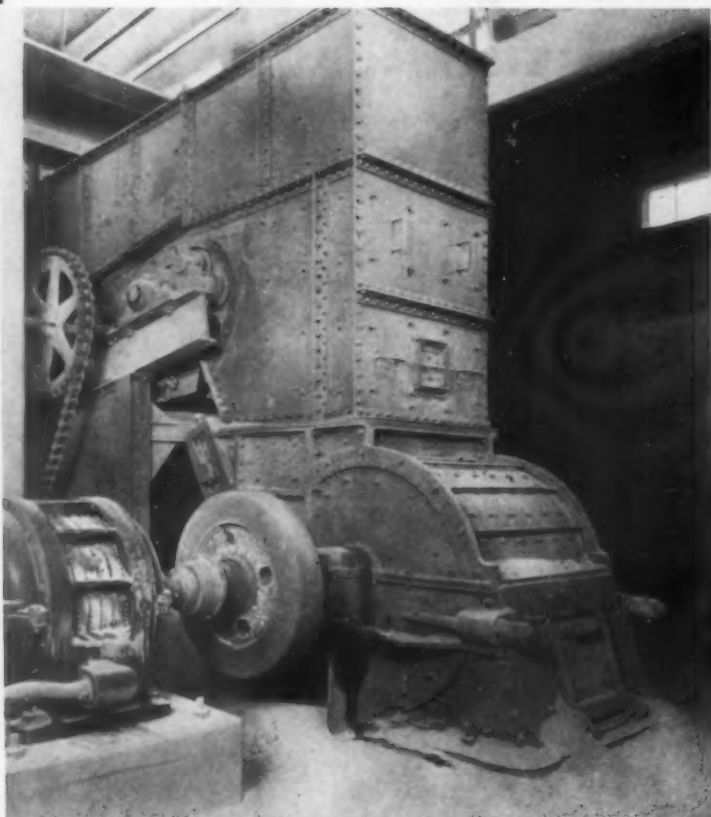
## CATERPILLAR DIESEL

REG. U.S. PAT. OFF.



**ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT**

51,000,000 TONS OF AGSTONE NEEDED ANNUALLY  
**MEANS LARGE CAPACITY EQUIPMENT**



**DIXIE**  
**NON-CLOG**  
**HAMMERMILLS**

*Will Assure Large  
Capacity from  
Quarry Size Stone.  
Guaranteed  
Not to Clog.*

This powerful Dixie Non-Clog Hammermill crushes feed from a 2½ cu. yd. shovel at the rate of 250 tons per hour. Its performance is typical of the greater capacity you can get by using Dixie Hammermills.

Dixie Hammermills are made in 14 sizes with capacities ranging from 10 to 100 tons per hour. They offer such outstanding features of advanced hammermill design as the Non-Clog moveable breaker plate and the adjustable feed end.

*Write for data.*

**DIXIE MACHINERY MFG. COMPANY**

4119 GOODFELLOW BLVD.

ST. LOUIS, MO.

# BLASTING

## for AGSTONE



... another case where  
fragmentation with  
**DETONITE** cuts down  
on over-all machinery  
and manpower needs.

**A**GSTONE is certainly one of the big wartime rock product markets. And producers who use King's Detonite\* materially reduce the pressing problem of critical labor and machinery supplies. The clue to this connection is in the kind of fragmentation Detonite gives.

Because of its slow detonating speed, Detonite, the patented surface-sensitized high explosive made only by The King Powder Co., gives a heaving, spreading effect which brings down the stone in sizes that can be handled easier by your shovel . . . and by your crusher.

### DETONITE:

1. **REDUCES** secondary blasting.
2. **SAVES** irreplaceable equipment.
3. **LOWERS** explosive costs.
4. **HELPS** meet war schedules.

Let us demonstrate Detonite in your quarry. You'll use less explosive per ton . . . and your equipment will lead a longer and more useful life by not laboring with heavy, cumbersome pieces of stone. Write, wire, or phone us today (Cincinnati, MA in 4609, reverse charges) and make a date with a King representative.

\*

# DETONITE

THE PATENTED SURFACE SENSITIZED HIGH EXPLOSIVE



# **RUBBER is vital for Industry to keep the War machine moving**

All of us should keep our eyes on the ultimate goal, to that time when the civilian trade can be supplied with all the Industrial Rubber Products they need.

Some reverses have been experienced in the War progress, which none of us like. But it is a case of everybody setting their jaws and performing their assigned tasks to make final victory that much sooner.

Quaker is producing at maximum capacity. Millions of feet of belting and hose together with tons of rod and sheet packings are going to help keep the war machine in operation—you would not want it otherwise, even though it deprives you of much longed for stock.

All orders for the Army, Navy, Air Forces, are being rushed to completion. We are serving industrial and civilian uses to our best ability under the present circumstances.

Though the exact product you want may not be available, Quaker can offer and suggest what can be used during the present emergency.

Quaker is at your service to help you whenever industrial rubber goods are involved. For sixty years Quaker has been manufacturing Quality Industrial Rubber Products . . . Belting—Hose—Packings—and Moulded Parts. Regardless of what your rubber problem may be, feel free to consult with us.

*"If there is a way to get it done—Quaker will do it"*

## **QUAKER RUBBER CORPORATION**

*Mfrs. Industrial Rubber Products*

**PHILADELPHIA 24, PA.**

**NEW YORK 7  
CLEVELAND 15**

**CHICAGO 16  
HOUSTON 1**

*Western Territory:*

**QUAKER PACIFIC RUBBER COMPANY  
SAN FRANCISCO 5 • LOS ANGELES 21**





# BUILD BETTER "Farm to Market" Roads

Building better FARM TO MARKET roads will have no small bearing on the nation's prosperity for many years to come. Not only do they provide direct and indirect employment but they are essential to the livelihood, food, clothing, shelter, education and social contacts of millions. Good country roads have long been credited with raising the standard of living and increasing the efficiency of the farmers which, in turn, has meant better living for all.

Better country roads will be built because modern machinery can turn out better materials at lower cost, saving money to build many extra miles. The Cedarapids Junior Tandem is a highly portable plant which can be easily moved about to economically produce, *on the job*, the aggregate in the smaller tonnages required for individual country road jobs. Their low first cost, high efficiency, long trouble-free operation and their ability to handle a wide range of jobs mean more miles of better roads at less cost. Your Iowa dealer will be glad to tell you more.

**IOWA MANUFACTURING CO.**  
Cedar Rapids, Iowa

... with aggregate from a  
Cedarapids Junior Tandem

## Cedarapids

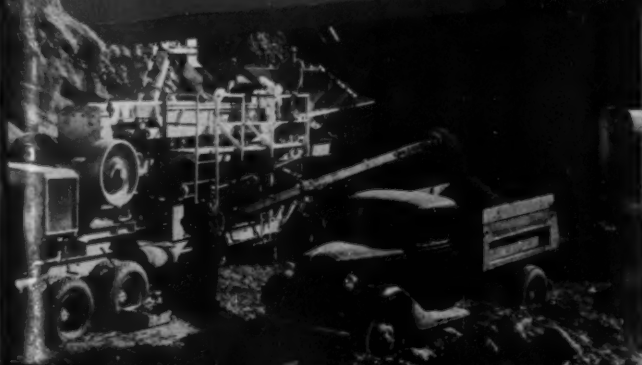
Built by  
IOWA

### THE IOWA LINE

#### of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS  
BELT CONVEYORS—STEEL BINS  
BUCKET ELEVATORS  
VIBRATOR AND REVOLVING  
SCREENS  
STRAIGHT LINE ROCK AND  
GRAVEL PLANTS  
FEEDERS—TRAPS  
PORTABLE POWER  
CONVEYORS

PORTABLE STONE PLANT  
PORTABLE GRAVEL PLANT  
REDUCTION CRUSHERS  
BATCH TYPE ASPHALT PLANT  
TRAVELING (ROAD MIX)  
PLANTS  
DRAG SCRAPER TANKS  
WASHING PLANTS  
TRACTOR-CRUSHER PLANT  
STEEL TRUCKS AND TRAILERS  
KUBIT IMPACT BREAKERS



# It pays to be a Bemis Multiwall paper bag Customer

EVEN though direct government purchases have taken a considerable part of our multiwall paper bag production this year, Bemis customers have not suffered . . . they have been supplied on the basis of past purchases, even in the face of the labor shortage and no increase in facilities.

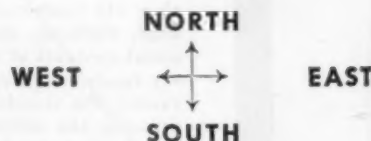
Naturally, the demand for Multiwalls has been greater than the supply. Much as we regret inability to fill all orders, we have felt a responsibility to take care of our regular customers first. Fortunately, we've been able to do that—and right on schedule. If it's humanly possible, we'll keep on maintaining this service.

War or peace, we want our customers to feel that it pays to be Bemis customers.



## BEMIS BRO. BAG CO.

Baltimore • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver  
Detroit • Houston • Indianapolis • Kansas City • Los Angeles • Louisville  
Memphis • Minneapolis • New Orleans • New York City • Norfolk • Okla-  
homa City • Omaha • St. Louis • Salina • Salt Lake City • Seattle • Wichita



A major reason we've been able to supply our Multiwall customers is the size and flexibility of our production facilities.

### Bemis Multiwall Plants at

PEORIA, ILL.  
EAST PEPPERELL, MASS.  
MOBILE, ALA.  
SAN FRANCISCO, CALIF.  
WILMINGTON, CALIF.  
ST. HELENS, ORE.

These plants not only give us large production, but also quick accessibility to all parts of the country.



East Pepperell, Mass.

# As Your Agricultural Limestone Demands Increase, Rely on

## THE RUGGEDNESS OF AMERICAN CRUSHERS



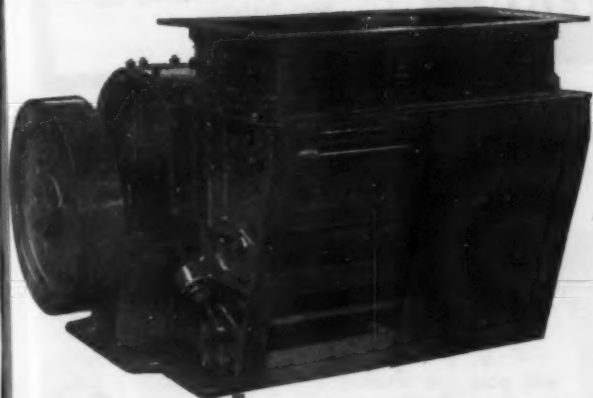
An AMERICAN Crusher with the back cover removed to show the rotor assembly. AMERICAN Crushers are built with such outstanding features as heavy cast construction, cast steel adjustable platen, cast steel discs, heavy alloy steel shaft, SKF spherical roller bearings, and manganese lined crushing chamber. The manganese steel rings or hammers are of an original AMERICAN design which strikes the stone in suspension and then shatters and distributes it before it reaches the breaker and grinding plates.

■ The farmers' need for agricultural limestone is an annual one. It will not fall off after the war ends. If anything, it will increase. And that's why you want to use the crusher with the outstanding record for ruggedness—the crusher that will work year after year with the same high efficiency and with a minimum of upkeep.

In that you can make no better choice than an AMERICAN crusher. Ruggedness has been carried through to every part in AMERICAN Crushers. Ruggedness not merely to withstand the harsh operating conditions expected of your agricultural limestone crusher, but ruggedness with the finest materials designed to give quick action, fine-grinding action, and free movement of all working parts.

Let us show you how an AMERICAN Crusher will help you produce agricultural limestone economically and dependably, as it already does for hundreds of other producers.

Write Us Today



THE SHIELD OF EFFICIENT CRUSHING

**AMERICAN PULVERIZER CO.**

1245 MACKLIND AVE.

ST. LOUIS 10, MO.

# ROEBLING



## QUESTIONS AND ANSWERS

**Q** What is meant by the designations of 6x7, 6x19, 8x19, and 6x37 rope?

**A** Each of the above designate a particular group or classification of wire rope: the 6x7 rope contains 6 strands of 7 wires each, whereas the 6x19 rope contains 6 strands with from 16 to 25 wires per strand. The 8x19 rope contains 8 strands with from 16 to 25 wires per strand, while the 6x37 rope contains 6 strands having from 26 to 46 wires per strand.

**Q** How do the above groups or classifications of ropes compare as to abrasion resistance and flexibility?

**A** The 6x7, 6x19, 8x19 and 6x37 ropes are rated as listed with respect to abrasion resistance, the 6x7 having the greatest resistance to abrasion. The flexibility of these ropes follow in the same order with the 6x7 having the least flexibility.



## CHOOSE WIRE ROPE FOR THE LONG PULL!

You've GOT TO KEEP the flow of aggregates going at top speed these days—despite manpower shortages. That means greater demands on your equipment. And whether it's for stripping or loading, hauling or stockpiling—efficiency depends on wire rope with capacity to deliver...day in and day out. That's why, when the heat's on to meet production schedules, you can have confidence in Roebling "Blue Center" Wire Rope...and its all-around, built-in quality.

Combining strength and flexibility with fatigue-and-abrasion resistance, Roebling "Blue Center" Wire Rope reduces maintenance problems, expensive stoppages... and operation costs.

And remember that Roebling, with a century's background of wire specialization, can help you choose the

right rope for your job. Check with our nearest branch office, and get started on the way to increased output from your rope-rigged equipment. Our wire rope engineers are always at your service.

### JOHN A. ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

Branches and Warehouses in Principal Cities

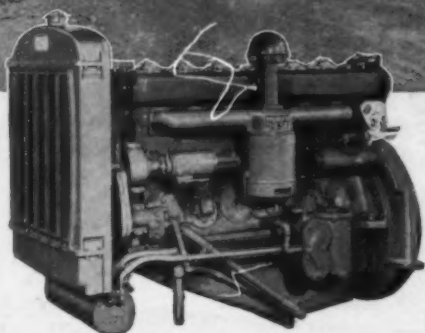
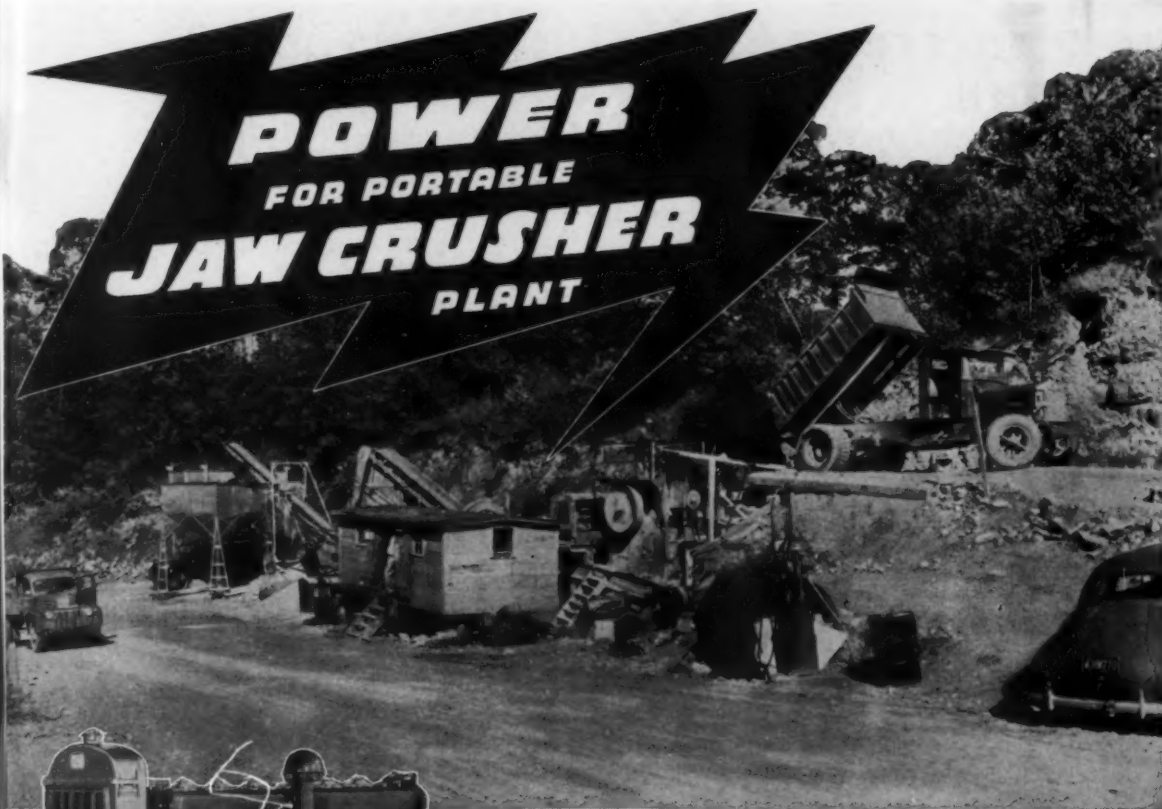
WIRE ROPE AND STRAND • FITTINGS • SLINGS  
ELECTRICAL WIRES AND CABLES • COLD ROLLED STRIP  
WIRE CLOTH AND NETTING • SUSPENSION BRIDGES AND  
CABLES • HIGH AND LOW CARBON ACID AND BASIC  
OPEN HEARTH STEELS • ROUND AND SHAPED WIRE • AERIAL WIRE  
ROPE SYSTEMS • AIRCORD, SWAGED TERMINALS AND ASSEMBLIES



## PACEMAKER IN WIRE PRODUCTS



# POWER FOR PORTABLE JAW CRUSHER PLANT



Model ME-6,  $5\frac{3}{4} \times 6\frac{1}{2}$ , 6 cyl., 160 H.P.  
Murphy Diesel, powering Universal Engineering Company's Portable Jaw Crusher, owned by Art Overgaard, Elroy, Wis.

MURPHY DIESELS give a good account of themselves wherever called upon to power machinery for the construction industry, because they are engineered for the rugged service demanded from rock crushers, hoists, sand and gravel plants, pumps, excavating and loading machines, locomotives, logging and lumber plants, mines, barges, tugs, work boats . . . for heavy electrical loads . . . and for other heavy-duty jobs which they do economically and well.

They are compact, relatively light in weight, simple in construction, with plenty of reserve power. Operating and maintenance costs are low . . . no premium-priced fuel required . . . more power, more profit are assured. Write for bulletin.

★ Buy U. S. War Bonds ★

MURPHY DIESEL COMPANY

5315 West Burnham Street  
Milwaukee 14, Wis., U. S. A.

More Power

**MURPHY  
DIESEL**  
Reg. U. S. Pat. Off.

More Profit

Engines: FROM 90 to 215 HP  
Generators: FROM 60 to 115 KW

"FIELD-PROVEN Power"

102

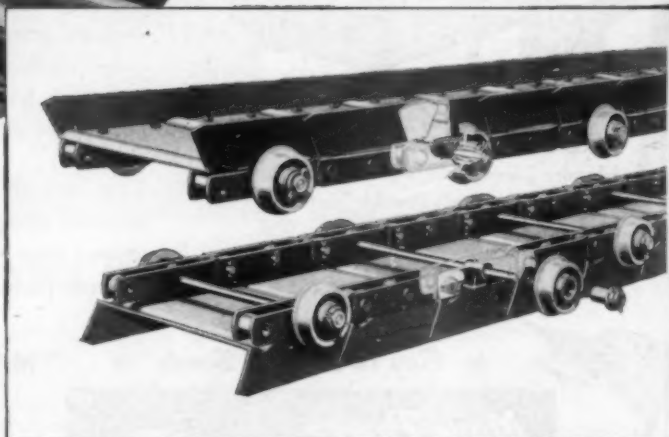
# HOW TO STOP "Leaks" IN YOUR *Handling Systems!*

① **YOU CAN STOP WASTEFUL LEAKAGE** and spillage in handling heavy bulk materials with Rex Leak-proof Apron Conveyors. They can help you step up the flow of bulk materials—increase plant operating efficiency at lower costs.



② **EFFICIENT MASS MOVEMENT** of ore, coal, rock, stone, gravel, sand, chemicals and other bulk materials can be handled smoothly and economically on rugged, dependable Rex Leak-proof Apron Conveyors. Easy to install, they can be used as incoming supply feeders—outgoing feeders to other units—or as long horizontal or inclined conveyors. Capacities range from a few to hundreds of tons per hour.

③ **REX EQUALIZING SADDLES** and outboard rollers keep the load moving without stops or costly shutdowns. Cutaway view shows Rex Leak-proof Apron Conveyor equipped with Rex Chabelco Steel Chain and equalizing saddles. Note how pulling load is applied only at center line of each chain to avoid eccentric side loads. The outboard rollers, with bushings, carry the entire load independent of chain. Welded pan design eliminates side leakage. These are but few of the many advantages you get with Rex Leak-proof Apron Conveyors.



Rex maintains a staff of experienced materials-handling engineers who can help you with any problem you have involving the efficient and economical moving of materials. Why not let them help you? There is no obligation. Write Chain Belt Company, 1649 W. Bruce St., Milwaukee 4, Wisconsin.



**APRON CONVEYOR**

**For Efficient Handling of Bulk Materials**

**CHAIN BELT COMPANY OF MILWAUKEE**

Rex Chain Belt and Transmission Division, Rex Conveyor and Process Equipment Division, Milwaukee 4, Wisconsin • Baldwin-Duckworth Division, Springfield 2, Massachusetts

# Check these Savings

## AGAINST YOUR PRESENT PACKAGING METHOD



**M**ULTIWALLS are tough and sturdy, too. Made of from 2 to 6 plies of special kraft paper, they will be specially designed to meet specific conditions involving excessive dampness and rough handling.

So, if you are not already using Multiwall Paper Bags, why not find out how they can save money, minutes, and material. Your inquiry will receive prompt and careful attention. Write today.

IN CANADA:

St. Regis Paper Co. (Can.) Ltd.  
Montreal, Quebec  
Vancouver, British Columbia

Boston, Mass.   Birmingham, Ala.   Dallas, Tex.   Denver, Colo.   No. Kansas City, Mo.   Los Angeles, Calif.  
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**MULTIWALL**  
PAPER BAGS  
MULTIPLY PROTECTION • MULTIPLY SALEABILITY!  
**ST. REGIS PAPER COMPANY**  
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NEW YORK 17: 230 Park Ave.   CHICAGO 1: 230 No. Michigan Ave.  
BALTIMORE 2: 2601 O'Sullivan Bldg.   SAN FRANCISCO 4: 1 Montgomery St.



# INVESTIGATE THIS *Better* WAY TO WASH SPECIAL INDUSTRIAL SANDS



## CLOSE SEPARATION for GLASS and FOUNDRY Sand

If you supply washed sand for special uses — such as for foundry moulding and glass making, it will pay you to investigate the AKINS Classifier. This machine produces sands to exacting specifications for practically any special industrial use. Power costs are low . . . maintenance negligible. Unloading is unnecessary to start after shutdown. Let one of our engineers present the facts in detail.

LOWDEN DRYERS  
SKINNER MULTIPLE HEARTH ROASTERS  
BALL, ROD & TUBE MILLS  
SMELTING EQUIPMENT



**COLORADO  
IRON WORKS**  
*Company*

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.  
Vancouver Iron Works, Ltd., Vancouver, B. C., Can.  
Head, Wrightson & Co., Ltd., Stockton on Tees, England  
Head, Wrightson & Co., (So. Africa) Ltd., Johannesburg  
The Clyde Engineering Co., Ltd., Granville, M.S.W.

**MAIN OFFICE & WORKS: DENVER 2, COLO., U.S.A.**



# SAVE MONEY

# WITH DOUBLE-DUTY TOURNAPULLS



**T**ournapull interchangeability will help increase your profits by giving you (1) extra hauling capacity during your busy season with Tournatrailer plus (2) low-cost stripping during your light production months with Carryall Scraper. Both trailing units are powered by the job-proved 150 h.p. Tournapull prime mover. Both are cable operated from the same LeTourneau Power Control Unit, mounted at the rear of the Tournapull, and are quickly and easily interchanged.

This lowers equipment investment by distributing the cost of the Tournapull prime mover over many of your pit and quarry operations. No expensive one-purpose rigs stand idle during your off seasons.

If you are using old specialized equipment for your stripping and materials hauling, it will pay you to let your LeTourneau distributor show you how interchangeable Tournapulls can help you move more yardage faster, at lower cost with fewer units and men. See him **TODAY.**

PQ2

## TOURNATRailer for rock-shovel loading

For your rock or aggregate hauling, consider these Tournatrailer advantages:



1. One spot takes approximately 20 tons of rock away from the shovel.
2. Overall height of 8', with 8' x 12' 8" top opening speeds shovel loading.
3. Hauls at 14.9 m.p.h. in high gear, plus plenty of power to get into high quickly and climb quarry grades easily.
4. Load rides between big 21.00 x 24 tires; no spring maintenance. No overloading of tires on uneven ground nor wedged-rock damage as with duals.

5. To dump, cable-controlled trailer body slides back, cleans load off bed, out the rear, clear of tires. By opening slowly, material can be spread as you move forward.

## CARRYALL SCRAPER for stripping and handling gravel

For lower cost stripping and gravel production, Tournapull-powered Carryall Scrapers offer you:

1. Loading, hauling or spreading in a single 15-yard unit.
2. It strips heaping loads in shallow overburden as efficiently and at the same low cost as it does on deep cuts.
3. More return from your equipment investment because Tournapull prime mover keeps earning the year 'round . . . stripping with Carryall during your light production months . . . and during your busy season handling your major hauling work with Tournatrailer.
4. On gravel operations, Tournapull-Carryall will strip the pit, load and haul gravel to the washer or screening plant, dump through grizzly.
5. For road surfacing, can load from pit or stockpile, haul and spread in place.

**JOB-PROVED**  
Over 2800 Built  
and Shipped



# LETOURNEAU

# Electric Power FROM A CONVEYOR BELT!



## UNUSUAL? VERY — BECAUSE MOST CONVEYOR BELTS CONSUME POWER

At the Jewell Ridge Coal Company's mine at Tazewell, Va., coal is delivered to a conveyor belt which descends 215 feet, at a 15-degree slope, through a distance of 826 feet to the tipple below.

A regenerative motor starts the belt, but with full load and speed the motor automatically functions as a dynamo, generating a constant 30-kilowatt flow of electric power, and providing perfect speed control drag.

This was not only an unusual but a brilliantly successful integration of mine topography and sound engineering.

The belt is of Bull Dog quality, 48" wide, total overall length 1843 feet, and was vulcanized endless on the job by BWH engineers.

It is now over 7 years old and has stretched less than 3 feet though 10 times that amount was provided for. It looks as good as new and its eventual retirement is not foreseeable. Surely, this was straightforward belt building.

Whenever belts must possess the unusual in stamina, dependability and character, be sure to consult our nearest distributor and field technician, or write us direct.

**BOSTON WOVEN HOSE & RUBBER COMPANY**

Works: Cambridge, Mass., U.S.A.

P.O. Box 1071, Boston, Mass., U.S.A.



# Do You Remember — That Agile Central Mixing Plant?



Be on the lookout for a Butler central mixing plant; height about 75 feet; wearing a coat of gray paint; last reported in the State of Washington; has also been seen in Texas, Utah, and Indiana. Has a long record of production—nearly 600,000 cubic yards of concrete poured, and more to come. 150 yards per hour for days on end.

Though it sounds something like a mystery novel, there is really nothing mysterious about the remarkable performance of this plant—it is a Butler Engineered Design. Butler engineers have been designing

plants for more than twenty years, plants whose efficiency, dependability, and versatility are built in. No wonder, then, that they are as good on their tenth job as on their first.

If you have a concrete job, large or small, be sure to call upon the Butler engineer. His suggestions are available to you regarding central mixing plants, ready mixed concrete plants, bulk cement plants, batch bins, and crushing plants. The first step toward the most successful job is Butler Engineered Design.



## Presto!

### IT'S REAPPEARED AGAIN!

During 1944 a Butler advertisement appeared which said, "Be on the lookout for a Butler central mixing plant; height about 75 feet; wearing a coat of gray paint; last reported in the State of Washington; has also been seen in Texas, Utah and Indiana. Has a long record of production—nearly 600,000 cubic yards of concrete poured and more to come. 150 yards per hour for days on end."

That Butler central mixing plant with an itch for sight-seeing has now appeared in Arkansas. The

prophecy of "more to come" was no exaggeration for the total production of that rugged Arkansas Traveler is today well over a million yards—and—we repeat—"more to come".

A million yards! That's equivalent to a concrete highway 8 inches thick, 20 feet wide and 384 miles long! Whether it's central mixing plants, ready mixed concrete plants, bulk cement plants or batch bins Butler Engineered Design generally means service far beyond reasonable expectations.



**BUTLER**  
BIN COMPANY  
WAUKESHA, WISCONSIN





HOW YOU PROFIT BY



# *Pre-Engineering*

● Here's a *factory-built* conveyor system that will fit your *custom-built* plant completely!

No special engineering. No delay for estimates on cost. No weeks of waiting for factory fabrication. Barber-Greene Conveyors are pre-engineered—pre-fabricated!

B-G Conveyors are built in a variety of sizes, forms and capacities, that they'll meet any material handling requirement . . . can be installed anywhere.

Erection costs? Your own workmen can install a B-G Conveyor system quickly, easily. Units arrive on the job conveniently marked. Factory assembled terminals and standardized units simplify and speed erection.

Barber-Greene Conveyors are *standardized*. You can make additions and alterations rapidly . . . move it to a new location with 100% salvage. Factory assembly assures correct alignment in erection—reduces belt wear and maintenance expense. Write for Catalog 76. Barber-Greene Company, Aurora, Illinois.



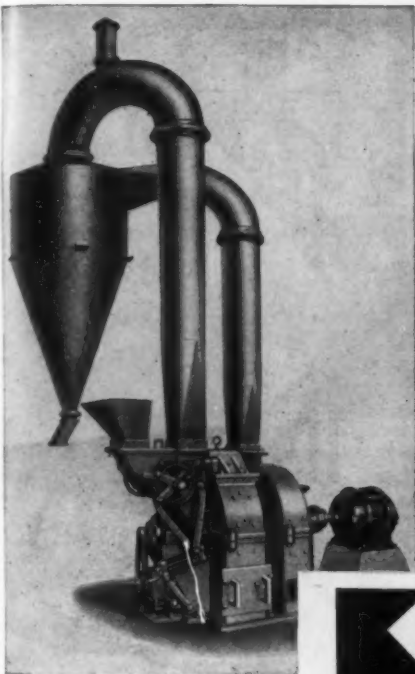
**Barber-Greene**



*Constant Flow Equipment*







Standard Raymond  
IMP MILL  
with air separation



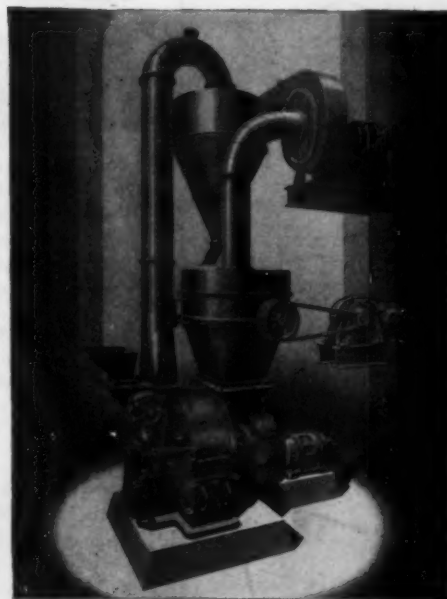
## RAYMOND IMP PULVERIZER

THIS versatile grinding unit is the answer to many different pulverizing and separating problems in the rock products industry.

It may be arranged in various ways:

1. Standard unit with air separation, including piping and cyclone collector, as shown above.
2. In combination with the Mechanical Air Separator for closed circuit grinding operations.
3. Equipped with whizzer type separator to provide wide range fineness control and uniform classification.
4. With flash drying system for calcining operations, drying and grinding moisture laden materials.
5. For direct-firing small kilns and industrial furnaces . . . pulverizing coal or pitch.

If your production problem involves: drying, grinding, separating, direct-firing or a combination of these, write for further details of the Raymond IMP MILL.



IMP MILL with whizzer type  
air separator

**RAYMOND**  
PULVERIZER DIVISION



COMBUSTION ENGINEERING COMPANY, INC.

Sales Offices in Principal Cities  
Canada: Combustion Engineering Corp. Ltd., Montreal

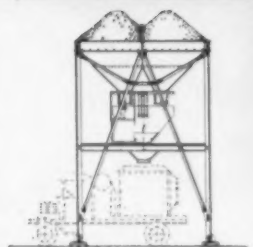
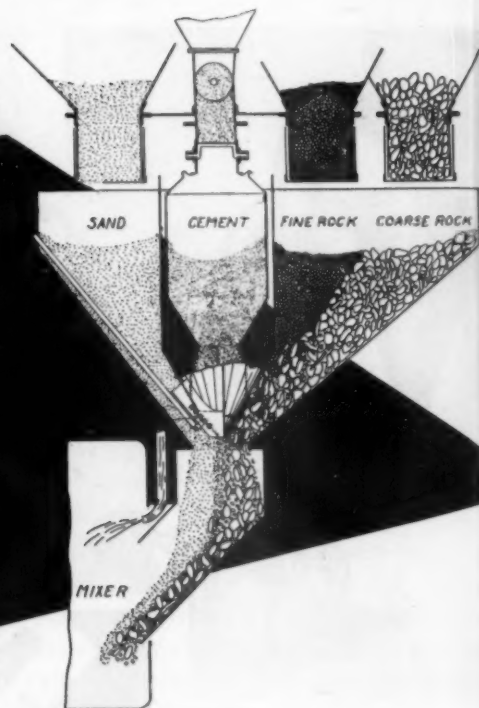
1307 North Branch Street, CHICAGO 22, ILL.

# JOHNSON

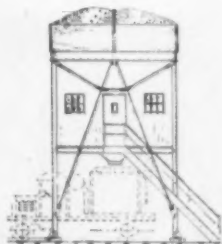
## Step-by-Step

## TRUCK MIXER PLANTS

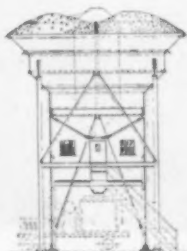
**Keeps Your Investment  
In Line with Your  
Volume**



30-yard 2 material Bin. Recommended for operators with a limited market for ready mixed concrete.



60-yard 3 or 4 material Bin. The bin leg section of the 30-yard unit requires no additional reinforcing when capacity is increased to 60 cubic yards. Bulk cement compartment also available.



120-yard Bin. For handling a large volume of business, and if a greater storage capacity is desired.

When you plan a central mix plant it's difficult to estimate potential volume. Naturally you want to hold your initial investment to a minimum. But, unless your equipment is flexible, volume increases may necessitate discarding much of your initial investment.

The Johnson Step-By-Step Bin is designed to solve this problem. It can be progressively enlarged as demands dictate . . . without discarding a single dollar's worth of the original plant.

Diagrams at the left show how a 30 yard Johnson Step-By-Step Bin can be progressively enlarged to 60 yards and 120 yards. With this set up only the investment to meet present demand need be considered. If and when volume grows, plant expansion is made easily, quickly and economically.

### Concentric Aggregate-Cement Batcher Assures A Full-Capacity Mixer Charge

The concentric aggregate-cement batcher (see diagram above) is used in all Johnson Batching Plants. It gives your plant the important ad-

vantages of (1) Pre-mixing, (2) Pre-shrinking, (3) Faster Discharging, (4) Elimination of Cement Dust and Mixer Gumming, and (5) Centralized Control.

This capacity-increasing batcher is a patented C. S. Johnson Company product. By accurate intermingling of aggregates with the cement when discharged, it provides *thorough pre-mixing and pre-shrinkage* which assures a full capacity mixer charge.

This thorough intermingling of aggregates and cement prevents cement from touching wet mixer opening and walls . . . eliminates gumming and excessive wear.

Cement dusting is reduced and the use of screws, chutes or other mechanical means of conveying the cement to the batcher is completely eliminated.

When planning a mixing plant, it will pay you to get all the facts on Johnson Step-By-Step Plants. Write us for details.

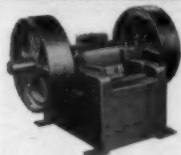
Write for Data on  
Johnson's  
ELEVATORS  
CLAMSHELL BUCKETS  
CEMENT STORAGE SILOS  
BATCHERS

**the C. S. JOHNSON COMPANY**  
CHAMPAIGN • ILLINOIS

# PIONEER

ROCK, ORE and GRAVEL CRUSHING · SCREENING · WASHING · HANDLING

## Plants and Equipment



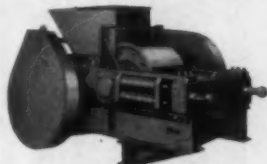
### JAW CRUSHERS

Overhead eccentric type for primary crushing. Will handle large material, has downward and forward crushing action. Sturdy design for high tonnage capacity.



### FEEDERS

Regulate flow of material to crushers to assure continuous high production. Medium and heavy duty types, horizontal or inclined; will bypass undersize.



### ROLL CRUSHERS

For secondary crushing and fine reduction. Star gears driven by belt and countershaft; manganese shells and anti-friction bearings. Delivers large tonnage, accurately sized.



### VIBRATOR SCREENS

Positive, uniform agitation. Circular motion for fast, accurate screening. Perfectly balanced, 4 SKF bearings for smooth operation; long life. Sagless, replaceable screens.



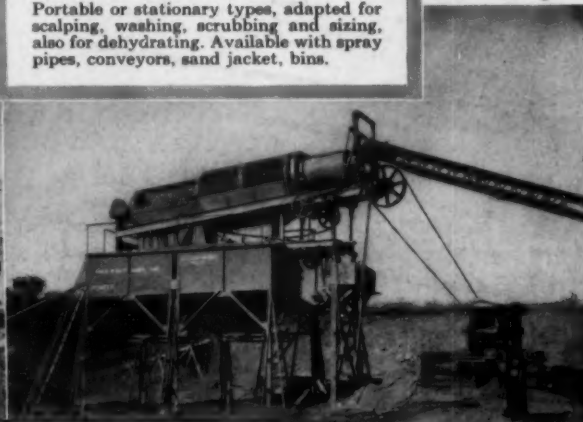
### BELT CONVEYORS AND ACCESSORIES

Standard sectional, knock-down type, welded lattice frame reinforced. Plain or anti-friction bearings. Straight or troughing idlers; supports and belt tighteners.



### REVOLVING SCREENS

Portable or stationary types, adapted for scalping, washing, scrubbing and sizing, also for dehydrating. Available with spray pipes, conveyors, sand jacket, bins.



**Pioneer**  
ENGINEERING WORKS

JAW CRUSHERS · ROLL CRUSHERS · FEEDERS · VIBRATOR SCREENS · BELT CONVEYORS · WASHING PLANTS

MINNEAPOLIS 12, MINN.

Have primary and secondary crushers, screen and conveyor. Produce aggregate for road surfacing and other construction. Available in 3 sizes, capacities to 300 t.p.h. Washing and dehydrating equipment optional.

### Portable Washing Plants

Washes, screens and dehydrates to produce sand and several sizes of aggregate. Crusher optional. Pioneer also builds portable and stationary quarry plants, as well as travel-mix and central mix bituminous plants.

# Take This Quick Trip through a MULTICLONE dust collector

... see why it is more compact,  
more efficient, simpler to install!

## FEATURE #1

In the MULTICLONE only a simple inlet is required which is easier to install, easier to insulate and far more compact than conventional multiple manifold arrangements.



## FEATURE #2

Incoming gas is divided into many small proportions which are individually processed. Cleaning gas in many small units assures more thorough dust recovery than treating in a few large chambers.



## FEATURE #3

Gas enters each tube from the top, eliminating complicated multiple manifolds. Exclusive fold of side-entry gas into MULTICLONE vane then divides gas into eight gas streams, uniformly spaced around circumference of collecting tube. Assures absolutely uniform cleaning efficiency of gas for maximum cleaning efficiency!



## FEATURE #4

Gas is centrifugally cleaned in multiple small-diameter collector tubes. Because small-radius of small diameter of sharper radius of small diameter of tubes, higher centrifugal forces are generated to throw out extremely fine as well as coarser dust particles. Result—more complete recovery of all dust!



## FEATURE #5

Dust is discharged from collector tubes as quickly as separated. No screens to become clogged or choke gas flow. Draft loss remains uniformly low at all times ... and there are no filters to clean, replace or maintain!



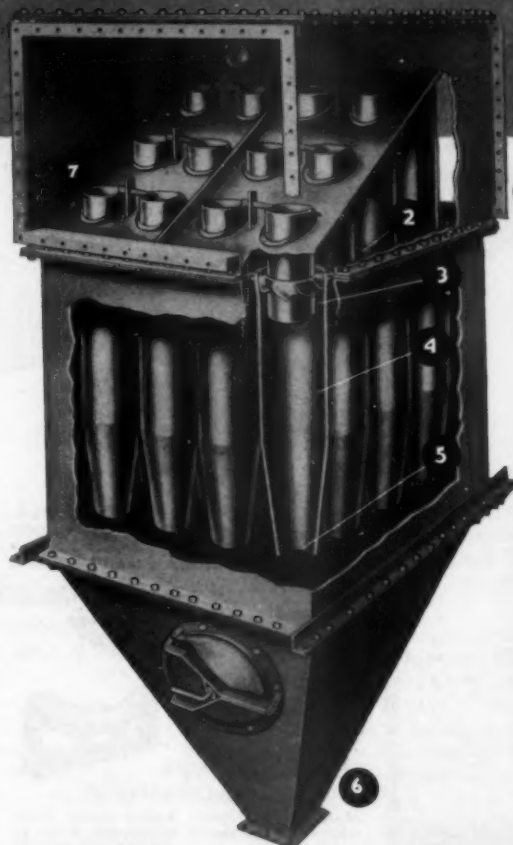
## FEATURE #6

Dust recovered from an entire bank of tubes is collected from a single discharge hopper. Much simpler and easier to service than multiple hoppers of conventional cyclone systems.



## FEATURE #7

Cleaned gas leaves the MULTICLONE from a single common outlet header which further simplifies duct work and installation as well as conserving space.



The MULTICLONE is the result of over 37 years concentrated research and development in the recovery of suspended materials from gases, beginning with the first commercial application of COTTRELL Electrical Precipitation. It embodies so many exclusive advantages—advantages that increase recovery efficiency, reduce installation costs, save valuable plant space and simplify maintenance—that you should get the complete MULTICLONE story before you install any type of recovery equipment. Send for this booklet...



WESTERN  
**Precipitation**  
CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR  
COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Office: 1006 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA  
CHRYSLER BLDG., NEW YORK 17 • 140 S. DEARBORN ST., CHICAGO 3  
HOBART BUILDING • SAN FRANCISCO 4, CALIFORNIA  
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL



## Getting results...in a BIG way!...

In 1939, when Hitler struck at Poland, trucks took only a few hundred thousands tons of ore from America's iron mines. In 1944, trucks hauled out OVER 50 MILLION TONS!

This ore plus scrap metal makes over 35 million tons of steel... more than all the steel in all passenger cars now on the road. It is steel enough for almost a million medium tanks... or over 110 million 50-cal. machine guns... or 15 million big 16-inch Navy shells... or more than 800 mighty battleships.

Huge 6-wheel, 30-ton capacity Macks like the one shown below, as sketched by Peter Helck, are doing a lion's share of this big ore-hauling job.

The biggest trucks in standard production today... these Macks have lowered open pit mining costs, while time and again setting new production records on the job.

Their work is typical of the many, many ways in which Macks, both big and small, are serving the people of America... and helping their owners cut costs.

Their stamina is a good example of why Macks for 44 years have been America's No. 1 line of trucks for tough hauling jobs.



★ BUY THAT EXTRA WAR BOND TODAY ★



Mack Trucks, Inc., Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N.J.; New Brunswick, N.J.; Long Island City, N.Y. Factory branches and dealers in all principal cities for service and parts.

**Mack**  
TRUCKS

FOR EVERY PURPOSE  
ONE TON TO FORTY-FIVE TONS



Performance  
Counts!

# For any material and any haul *Euclids* are your best bet!



No matter what your off-the-highway hauling problem may be . . . big loads . . . steep grades . . . short or long hauls . . . Rear-Dump and Bottom-Dump EUCLIDS will move more pay dirt faster and at lower cost. Built in every part for tough hauls, Euclids combine minimum vehicle weight with maximum power and strength for large capacity off-the-highway hauling.



Fast, easy loading with modern excavating equipment . . . speed in hauling and dumping . . . rugged dependability day in and day out . . . these are reasons why leading contractors and industrial users of hauling equipment are cutting costs and increasing production with Euclids . . . reasons why Euclids are *your best bet* for any material and any haul.

Write for your copies of two new books that show Rear-Dump and Bottom-Dump EUCLIDS at work on construction jobs and mine and quarry operations.

**The EUCLID ROAD MACHINERY Co. . . . Cleveland 17, Ohio**

# EUCLID

**SELF-POWERED  
HAULING EQUIPMENT**

For EARTH ROCK COAL ORE





*... but knows when to take it easy*

**I**NGERSOLL-RAND portable air compressors have always been work horses, but the present K-Series MOBIL-AIR units are far superior to any portables we have ever produced. They purr right along at full load without any fuss, and can keep right on doing it "around the clock."

But MOBIL-AIR compressors know enough to slow down and work at a slower speed whenever full output is not required. Their *capacity-control* practically eliminates wasteful idling. The average working speed of the engine and compressor is slower and more efficient. On an average job, the fuel savings at full load, plus those due to the slower speeds at part capacity, result in over-all savings up to 40% in vital gasoline. Wear and tear is reduced, and the machines last longer.

This *capacity-control* is accomplished by the Drill-More Multi-Speed Regulator, pioneered and introduced by Ingersoll-Rand in 1939. MOBIL-AIR compressors have other equally important features, too. Be sure your next portable is a MOBIL-AIR.

*Ingersoll-Rand also makes the tools that use the air.*

**Ingersoll-Rand**  
11 BROADWAY, NEW YORK 4, N. Y.

2-298

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • OIL AND GAS ENGINES

ROCK PRODUCTS, April, 1945

47

# A THORNTON Converted Medium Truck



**WILL PULL 26,000 POUNDS up a 50% grade**  
(G. V. W.)

**... and speed you along  
the highway at 40-50 M.P.H.**



The THORNTON Four-Rear-Wheel DRIVE consists of 2 driving axles; 2-speed gear case assembly with Automatic-Locking Differential; "walking beam" type springs; wheels; 8 new tires.



The heart of the THORNTON DRIVE is the exclusive THORNTON Automatic-Locking DIFFERENTIAL. Centered in the inter-axle gear case, it gives both axles POSITIVE DRIVE and DIFFERENTIAL ACTION without harmful, wasteful "axle fight." Available as replacement for conventional differential in many trucks. Write for descriptive information and models available.

The ODT, recognizing the importance of the THORNTON Four-Rear-Wheel DRIVE, allots 8 new tires with each Thornton unit. You get them for your truck when the unit is installed.

NO WPB RELEASE NECESSARY



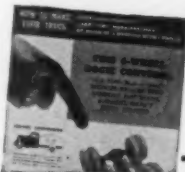
Very few truck operations ever encounter grades as steep as 50%. Yet it is comforting to know that your Thornton-equipped medium truck can climb such a grade, even when carrying a payload of 8 to 10 tons. This tremendous reserve of rim pull and climbing ability, made possible by Thornton's two speed gear case and two driving axles working in combination with the standard truck transmission, enables you to climb *with ease* the worst hills you ever will encounter.

With a Thornton Four-Rear-Wheel Drive installed on your 1½-2 ton truck, you also have 100% more payload capacity, plus speeds of 40 to 50 miles per hour on the highway! With 8 to 16 speeds forward, depending on the axle type, you have a suitable gear for every need. You get rugged, dependable performance . . . day in—day out . . . ability to walk right out of deep quarries, heavy snow, mud and muck. You keep on going in tough spots of logging, coal mining, lime spreading, oil field work and every other place where the ordinary single driving axle truck would be stalled.

The Thornton Four-Rear-Wheel Drive is the answer to every heavy trucking problem. Readily available without priority or ration release. Comes complete with 8 new tires.

Send coupon for details, advantages and performance data . . . today.

**FREE:** Mail coupon for descriptive folders and full details about the Thornton Four-Rear-Wheel Drive.



EVERY  
**THORNTON 4-Rear-Wheel DRIVE**  
INCORPORATES A  
**THORNTON Locking DIFFERENTIAL**  
ALSO AVAILABLE FOR TRUCK AXLES

## Thornton Tandem Co.

8701 Grinnell Avenue, Dept. 25, Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Make of Truck \_\_\_\_\_ Year \_\_\_\_\_  
Used for \_\_\_\_\_



# AID TO LOWER



(Above) Loading rocks into trucks in limestone quarry with a T4.

(Below) T4 TRAXCAVATOR loads light bituminous surfacing from stock pile.



## MATERIAL HANDLING COSTS

Put a TRAXCAVATOR to work on your digging, loading and material handling jobs and watch costs go down! These fast-working, highly mobile machines dig big loads with ease, carry them where needed and dump them into trucks, cars, hoppers or stockpiles. Stripping overburden, loading blasted rock or sand from the pit, carrying from stockpiles to hopper — are some of the many ways TRAXCAVATORS are cutting production costs and solving the manpower problem in pits, quarries and plants. They can probably help you too, so write us for full information and the name of the nearest dealer. TRACKSON COMPANY, Milwaukee 1, Wisconsin. Address your inquiry to Department RP45.



DIGS

GRADES

# TRAXCAVATOR

REG. U. S. PAT. OFF.

THE ORIGINAL TRACTOR EXCAVATOR



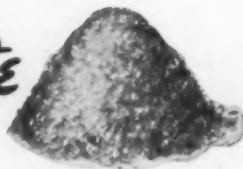
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CARRIES

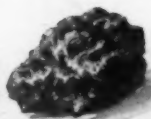
# The Case of the Oyster Shells



## the Dolomite



## and the Coke



**It is bad enough to have one difficult materials handling problem. But when you have three, then it really becomes serious. That is the fix in which a certain chemical company found itself.**

There were oyster shells and dolomite and coke—all to be unloaded, stocked in storage piles and reclaimed for use. The oyster shells tended to arch and pack; the dolomite was crystalline in form; the coke was frangible and friable. Each presented its own peculiar difficulties in handling, yet all would have to be handled on the same unified system.

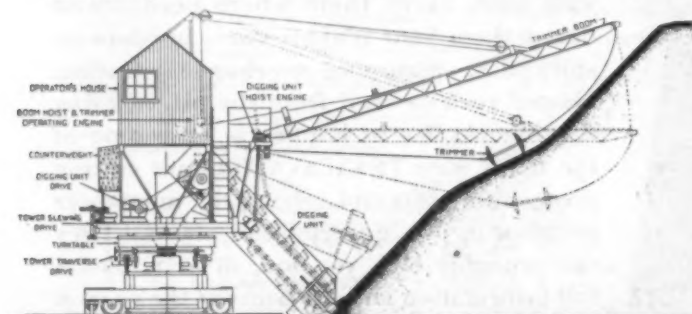
The problem was put up to Robins. Some parts of it were easy—the unloading, storing and conveying; the answers were drawn from our long and varied experience. But the reclaiming was something else again. Because the oyster shells

tended to arch and pack, because the coke was so easily broken, traditional reclaiming methods were not adequate; the shells would not flow and the coke would break.

Nothing in existence up to then was able to do the job properly. So Robins engineers had to invent something. We call it a "Digging Reclaimer." It under-mines the material—working along the bottom of the pile instead of the top. It reduces degradation and breakage to an absolute minimum. It reduces the cost per ton of material reclaimed to a figure never before reached.

Thus another difficult problem was solved. Thus another innovation was added to an already imposing list of Robins "firsts." Thus another company was able to obtain celerity, efficiency and economy in the handling of its materials.

Solving difficult bulk-materials handling problems has been a Robins habit since 1896. Perhaps you face one now. If so, you are invited to submit the facts to Robins for unbiased, non-obligating analysis. When writing, please address Dept. RP-4.



*Cross-section view of Robins Digging Reclaimer*

ENGINEERS, MANUFACTURERS AND ERECTORS OF MATERIALS HANDLING MACHINERY

**ROBINS makes:** BELT CONVEYORS • COAL AND ORE BRIDGES • BUCKET ELEVATORS • CAR AND BARGE HAULS • CAR DUMPERS • CAR RETARDERS • CASTINGS • CHUTES • CONVEYOR IDLERS AND PULLEYS • CRUSHERS • FEEDERS • FOUNDRY SHAKEOUTS • GATES • GEARS • GRAB BUCKETS • PIVOTED BUCKET CONVEYORS • VIBRATING SCREENS • SCREEN CLOTH • SELF-UNLOADING BOAT MECHANISMS • SKIP HOISTS • STORAGE AND RECLAIMING MACHINES AND SYSTEMS • TAKEUPS • LOADING AND UNLOADING TOWERS • TRIPPERS • WEIGH LARRIES • WINCHES • WINDLASSES

FOR MATERIAL AID IN MATERIALS HANDLING . . . . . It's ROBINS

**ROBINS**  
**CONVEYORS**  
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# ROCK PRODUCTS

## Subsidies and the Liming Program

**T**HE REDUCTION in 1945 A.A.A. subsidy payments to farmers for their participation in soil conservation apparently has been construed to be the forerunner to a succession of reductions in appropriations that may lead to the virtual end of federal aid in the purchase of liming materials. Speculation exists as to how the agricultural limestone industry would fare if farmers are compelled to purchase liming materials out of their own pockets.

Hard-headed business men, many years in the industry, do not believe the theory of subsidies fits into a system of free enterprise. They are accustomed to digging up business through their own efforts and believe that their own sales organizations are capable of approximating the successful promotional and educational results of the A.A.A. Many of them have been doing just that, in anticipation of having to later.

Prices for farm products will have a bearing on whether the farmer could stand the cost of his liming materials. The ideal would be for him to receive enough for his produce that he could afford to buy liming materials just as he purchases a tractor or other farm implements.

Soils deplete unless they are replenished with adequate fertilizers and liming materials, and this depreciation is just as real as that for any piece of machinery or plant. The farmer is in a highly competitive business and supporters of subsidies in his behalf claim that prices paid by consumers for his products often do not cover the production cost for soil depreciation. So, they say the consumer (all of us) should pay to rebuild and maintain the soil through taxation.

### A.A.A. Achievements

Improvement and maintenance of soil fertility is a challenge to us as a nation. Our soil is exhaustible and everything practicable should be done to further conservation practices. If farm prices can be maintained to provide for total cost of production plus a fair profit, the intelligent farmer who has a history of experience with liming materials will continue the practice. He is interested in profits. Many substantial farmers have, in fact, preferred to pay cash for their limestone or lime.

The A.A.A. has done a magnificent job, through its educational and promotional program, in getting the farmer to lime his soil. Yet, the record annual tonnages spread during the war years are but one-third the minimum requirements to safeguard soil resources, so there remains a big job to be done.

Whether subsidies continue to be paid or not, levels of consumption for liming materials will continue to far exceed pre-war standards, for the reason that

exposure to the benefits of liming the soil has brought substantial results to millions of farmers. Producers of fertilizers, potash and phosphates, also stand to benefit now that the farmer has been conditioned to maintaining soil fertility.

Unfortunately, some agricultural limestones have been spread that have not converted sufficient calcium carbonate into calcium "soil" within the normal two to four years because they are too coarse. These inferior grades, some also low in neutralizing value, do not help the cause and would be forced off the market under a competitive system of merchandising.

While sales to substantial farmers undoubtedly could be sustained, even without subsidy payments, through aggressive merchandising and service, there remains sizeable acid acreage in the hands of the small farmer, where the first step in soil conservation has yet to be taken or little experience with liming materials has been gained. It has been a mistake to dump agricultural limestone in piles on the fields in some sections, where it has been allowed to remain untouched for several years, contributing nothing to soil conservation or to the accumulative experience history that furthers its use.

Producers serving other than the substantial farmer who is familiar with soil conservation, realize that their individual businesses might be at stake, should subsidies be materially reduced or eliminated. Many have not developed sales organizations and some were prevented from doing so under the pressure of meeting production quotas.

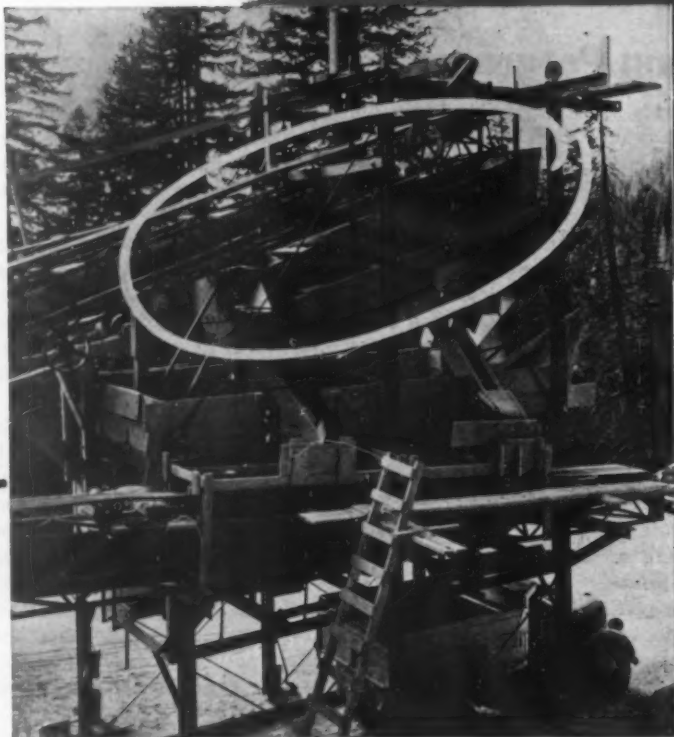
Those opposed to subsidies and government participation in business fear further encroachment on private enterprise. A pamphlet recently published by the U. S. Department of Agriculture in cooperation with the War Food Administration, entitled "A National Policy for Fertilizers and Liming Materials" seems to justify their fears. One of the methods for achieving the objectives in a proposed post-war program as set forth, specifically states that the development of additional sources of liming materials near to areas of need should be encouraged. One of the objectives is to improve methods of manufacture for low-cost production through research. That can only mean that government would exercise some control over privately-owned plants or set up plants of its own in competition with individual businesses. Nobody in business would want that to happen.

*Bror Nordberg*



## OUTSTANDING SCREENING PERFORMANCE UNDER

*Every*  
**IMAGINABLE  
CONDITION**



The 4' x 12' Triple Deck Simplicity Gyration Screen shown in this Temporary Plant handles 2000 tons per day of 18" and under rock. Another user reported an increase of 50% in plant capacity merely by replacing its screening unit with a Simplicity of the same size.

In the far-away corners as well as the cross-roads of the World, Simplicity Gyration Screens have been used and have given the same highly satisfactory results. Each report of new installations and uses confirms the testimony of long-time Simplicity users—that here is the screen that can be counted upon to give maximum tonnages of clean, accurately sized materials with low power

requirements and a minimum of maintenance. Standard features include a counterbalanced eccentric shaft; rubber-mounted screen corners, screens in four-way tension over doubly crowned surface, dust sealed Alemite lubricated roller bearings; extra rugged construction; and rubber cushioned power. Write today for the complete facts.

# Simplicity

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**ANNOUNCEMENT** has been made by Executive Secretary V. P. Ahearn of the National Ready Mixed Concrete Association that an application to the War Contracts Price Adjustment Board for extension of the exemption of ready mixed concrete from renegotiation has been approved. The official communication reads as follows: "Pursuant to the authority given to the War Contracts Price Adjustment Board by subsection (1) (4) of the Renegotiation Act of 1943, the Board, under the provisions of subsection (1) (4) (D) of the 1943 Act, has exempted from renegotiation amounts received or accrued during fiscal years ending after June 30, 1943 and prior to July 1, 1944, under contracts or subcontracts for the making or furnishing of the following articles: Ready mixed concrete."

## Defer Agstone Workers

J. R. Boyd, administrative director of the National Crushed Stone Association, recently announced in a bulletin that the War Food Administration has authority to certify deferment of workers engaged in the production of agricultural limestone. The new procedure for deferment of a limited number of men under 30 years of age calls for the filing of a new form, known as Form 42A (Special Revised), for certification by agencies in the Government responsible for procurement and production of war goods and those responsible for the maintenance of essential services. Employers may file the new form with the local Selective Service Board even though certification has been denied by the federal Government agency having jurisdiction. It may also be filed if the employer does not come within the jurisdiction of any federal agency.

## Concrete Masonry Opportunity

Recent restrictions of the War Production Board covering structural steel and lumber and a directive of the Office of the Chief of Engineers encouraging the use of masonry products emphasizes the opportunity offered concrete products manufacturers to secure a large part of the construction volume permitted under present conditions. The Army Engineers directive, dated February 10, stated that regulations governing "Conservation of Critical Materials for Construction Work" have been modified to provide that masonry or other less critical wood substitutes will be used on all construction

wherever practicable and where cost estimates for such alternate construction do not exceed 25 percent increase over the wood design. Circular Letter No. 3541 states, "The more expensive forms of masonry (including brick work) are not to be used while tile and block will give adequate service." Concrete floors also are recommended.

Schedule A to CMP regulation 6, WPB, dated February 7, relative to Construction Limitations, has the effect of practically requiring the use of masonry for walls and concrete floors for structures without basements. Limitations on steel for tanks also open opportunities for concrete pipe manufacturers to provide concrete tank substitutes.

## Cinder Block Prices

Authority has been granted by OPA to manufacturers of cinder concrete block in the Washington, D.C., area to increase block prices under MPR 188, 1499.161 (a) (2), effective March 3. The maximum prices allowed are as follows:

MAXIMUM PRICE, EACH		
Size	Yard Price	Delivered Price
<b>Hollow:</b>		
4 x 8 x 12.....	\$0.06½	\$0.07
6 x 8 x 12.....	.08	.09
8 x 8 x 12.....	.10½	.11½
12 x 8 x 12.....	.16½	.18
4 x 8 x 16.....	.09½	.09¾
8 x 8 x 16.....	.15½	.17
8 x 8 x 16 half regular.....	.08	.08½
8 x 8 x 16 corners....	.16½	.18
8 x 8 x 16 half corners.....	.08½	.09
8 x 8 x 8.....	.08	.09
12 x 8 x 16.....	.23½	.25
4 x 8 x 16.....	.09½	.10
<b>Solid:</b>		
4 x 8 x 12.....	.08	.09
8 x 8 x 12.....	.13½	.15½
4 x 8 x 16.....	.12½	.14
8 x 8 x 16.....	.22	.24
8 x 3 x 16.....	.08	.09

The Metropolitan Area of Washington, D.C., as used in this order means the area located within a 12 air-mile radius of the zero milestone, District of Columbia.

The maximum prices specified in paragraph (a) above, are subject to discounts, allowances, and price differentials at least as favorable as those in effect during March, 1942, to purchasers of the same class.

## Crushed Stone Prices

Maximum prices have been established by OPA for certain sizes of Miami Oolite limestone produced within a radius of 50 air-miles of the Dade county, Florida court house. These prices are as follows:

GRADE "A" CRUSHED STONE		
Abrasion Test Required		
Sizes	(*)	(†)
Sizes 1 to 9, inclusive.....	\$1.90	\$2.70
Sizes 10 to 16, inclusive.....	2.20	3.05
Sizes 17 and 18.....	2.60	3.45
GRADE "B" CRUSHED STONE		
Abrasion Test Required		
Sizes 1 to 9, inclusive.....	\$1.50	\$2.30
Sizes 10 to 16, inclusive.....	1.80	2.65
Sizes 17 and 18.....	2.20	3.05
GRADE "C" CRUSHED STONE		
No Abrasion Requirement		
Ballast (minus 2½ in. plus ¾ in.).....	\$0.95	\$1.70
Concrete rock (minus 1½ in. plus ¾ in.).....	1.20	2.00
Pea rock (minus ¾ in. plus No. 4).....	1.50	2.35
Rice rock (or chats) (minus ¾ in. plus No. 4).....	1.90	2.75
ROCK SCREENINGS		
No Abrasion Requirement		
Minus ¾ in. ....	\$1.00	\$1.75
MASON SAND OR SCREENINGS		
No Abrasion Requirement		
Minus ½ in. ....	\$1.00	\$1.75
LIME ROCK—PIT RUN		
Grade No. 1.....	\$0.90	\$1.65
Grade No. 2.....	.80	1.55

\*Maximum prices f.o.b. plant.

†Maximum prices delivered to job site within the Miami area.

Certain abrasion tests have been approved for two classifications of crushed stone. These tests are as follows:

Grade "A" crushed stone. Abrasion test—maximum loss by Los Angeles abrasion test, 35%. Gradation—Sizes 1-18, inclusive, as provided by Specifications for Materials for Road and Bridge Construction by the Florida State Road Department.

Grade "B" crushed stone. Abrasion test—maximum loss by Los Angeles abrasion test, 50%. Gradation—Sizes 1-18, inclusive, as provided by Specifications for Materials for Road and Bridge Construction by the Florida State Road Department.

Grade "C" crushed stone. No abrasion requirement:

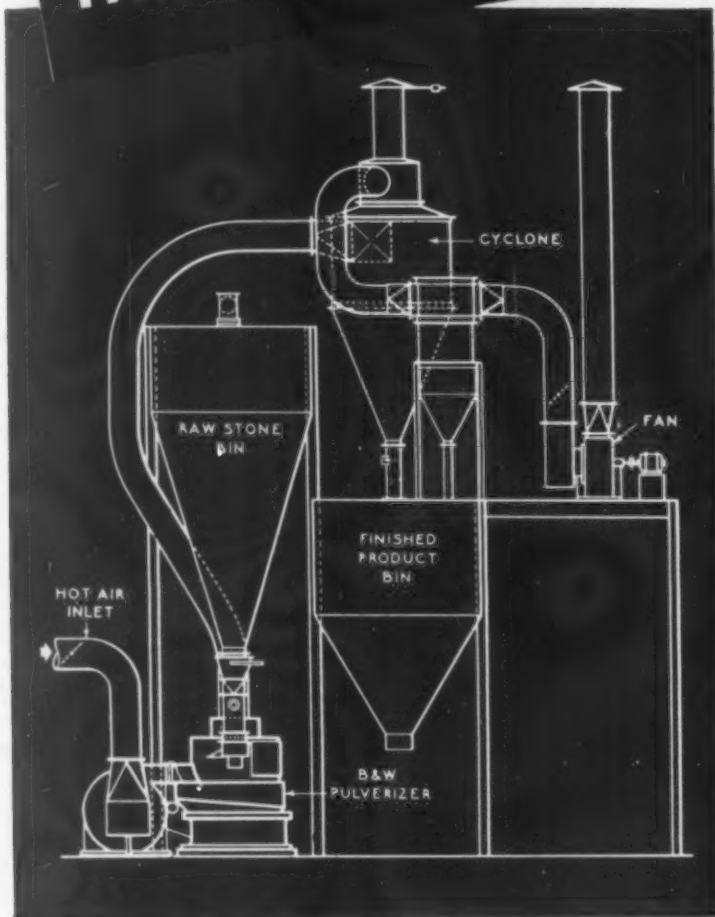
Ballast.....Minus 2½" plus ¾"  
Concrete rock.....Minus 1½" plus ¾"  
Pea rock.....Minus ¾" plus #4  
Rice rock (or chats).....Minus ¾" plus #4  
Rock screenings. Minus ¾"—no abrasion requirement.

Mason sand or screening. Minus ¾"—no abrasion requirement.

Lime rock—pit run. Grade 1 and Grade 2: Specification for materials for road and bridge construction by the Florida State Road Department.

The following producers, namely, The Naranja Rock Co.; E. Meekins; E. A. Pynchon; Seminole Rock Products Co.; Maule Industries; Kelly Rock & Sand Co.; all located in Dade and Broward Counties, Florida; selling aggregates subject to this ruling shall file with the Office of Price Administration, Building Materials Price Branch, Washington 25, D. C., within 15 days after March 31, 1945, and within 15 days after the close of each successive calendar quarter, thereafter, information covering net sales of the previous quarter.

# BLUEPRINT for economical limestone grinding



## B&W System for Grinding Limestone

**BABCOCK & WILCOX**  
NEW YORK 6, N. Y.  
85 LIBERTY STREET

Substantial savings in power and maintenance can be effected in the grinding of limestone by the use of Babcock & Wilcox Pulverizers.

Material handled flows through the mill in a thin, evenly distributed layer. Fines are discharged quickly, and are prevented from accumulating and interfering with the pulverizing operation. Each ball, co-acting with the grinding ring, works effectively over its entire travel, with the grinding pressure applied directly to the material—and to the minimum amount of material at a time. Result is efficient operation at low cost for power.

The large output of the B&W Pulverizer is due to the speed with which material passes through the mill, the plurality of grinding zones, and its positive grinding action. Provision can be made for drying within the system, if desired.

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# Rocky's NOTES

## The Farmer—And the Soil

**T**HE LIMESTONE quarry industry is agitated by an attempt to organize a new national association claimed to be designed to promote greater use, or maintain present use, of agricultural limestone. Apparently, an essential part of this proposed activity is to sustain A.A.A. subsidy payments to farmers for soil conservation programs.

There are many considerations in connection with this issue and a little review of previous efforts to make a national issue of agricultural lime and limestone promotion should be both interesting and instructive. From its founding in 1902, the National Lime Manufacturers' Association made promotion of agricultural lime one of its objectives. Its members early discovered the leading agronomists and agricultural experiment station directors who were already converts to the use of lime. The *Transactions* of the association contain many excellent papers by such pioneers as Dr. H. J. Wheeler, of the Rhode Island Agricultural Experiment Station. Unfortunately, lime manufacturers insisted on regarding pulverized limestone as a competitive material, although any one of them could have produced agricultural limestone as readily as lime.

From the start soil experts or agronomists refused to see any difference in the beneficial effects to the soil from the use of any kind of a liming material—oxide, hydrate or carbonate, with the result that the term "agricultural lime" came to mean any one of them. Burned lime (calcium and magnesium oxides) does have the advantage that for the same weight it contains about twice as much calcium and magnesium as the carbonate or pulverized rock. Also, after its application to the soil, it is much more finely divided, and therefore more readily available for quick assimilation by the growing plants. It also has some greater physical effect in rendering the soil more crumbly, or in agglomerating the soil particles, which renders the soil more workable. Very finely ground limestone, however, apparently has the same effect.

Lime has been used in agriculture in the Northeast and East Central States since colonial times, and early advocates of lime nearly all came

from the East. Not until fairly recent times was machinery developed for pulverizing rock economically enough to compete with lime, a factor which entrenched the use of lime in the older agricultural parts of the country. But lump lime, as originally used, had disadvantages when it came to shipping and distribution on the farm, and with the advent of commercial hydrated lime, this came to be used in preference to lump lime. However, hydrated lime contains about as much water of crystallization as limestone contains carbon dioxide, so the most forceful argument for using lime instead of limestone went overboard. Moreover, there is some reason for believing that the CO<sub>2</sub> in limestone is also good for the soil.

In the North Central West, under the very active Dr. Cyril G. Hopkins, of the University of Illinois, grew up a school of agronomists who advocated the use of coarsely ground limestone, or screenings, in preference to lime. There were various reasons: this material was cheap, abundant, and according to Dr. Hopkins, its slow reaction in the soil was a great advantage because its effect lasted much longer. Adjoining prairie state agronomists followed Dr. Hopkins' lead, and thus arose real competition between agricultural lime and agricultural limestone.

Ohio, the principal limestone quarrying state, as well as the largest lime-producing state, was in the middle. So, as early as 1914, we find the first attempt to harmonize the two groups of rival producers into one promotional organization, known as the Agricultural Lime and Limestone Association. An agronomist-manager, G. J. Wilder, was employed for the express purpose of promoting the sale of all kinds of liming materials: (1) by advertising, publicity and education; (2) by standardizing through law the various grades or varieties of liming materials—the ultimate objective of course being establishment of price differentials.

This attempt did not meet with

much success, for various reasons. Perhaps primarily it was impossible to reconcile sales arguments so diametrically opposite and prices so far apart. Anyhow, after A. P. Sandles, secretary of the Ohio Macadam Association (crushed-stone producers) had been elected secretary of the National Crushed Stone Association in 1918, he was asked to reorganize the Agricultural Lime and Limestone Association. This was done in 1919, and Mr. Sandles became also executive secretary of the re-named National Agricultural Limestone Association. The original organization had accomplished one good purpose; it had succeeded in getting agricultural limestone put on the list of essential industries during the war year, 1918.

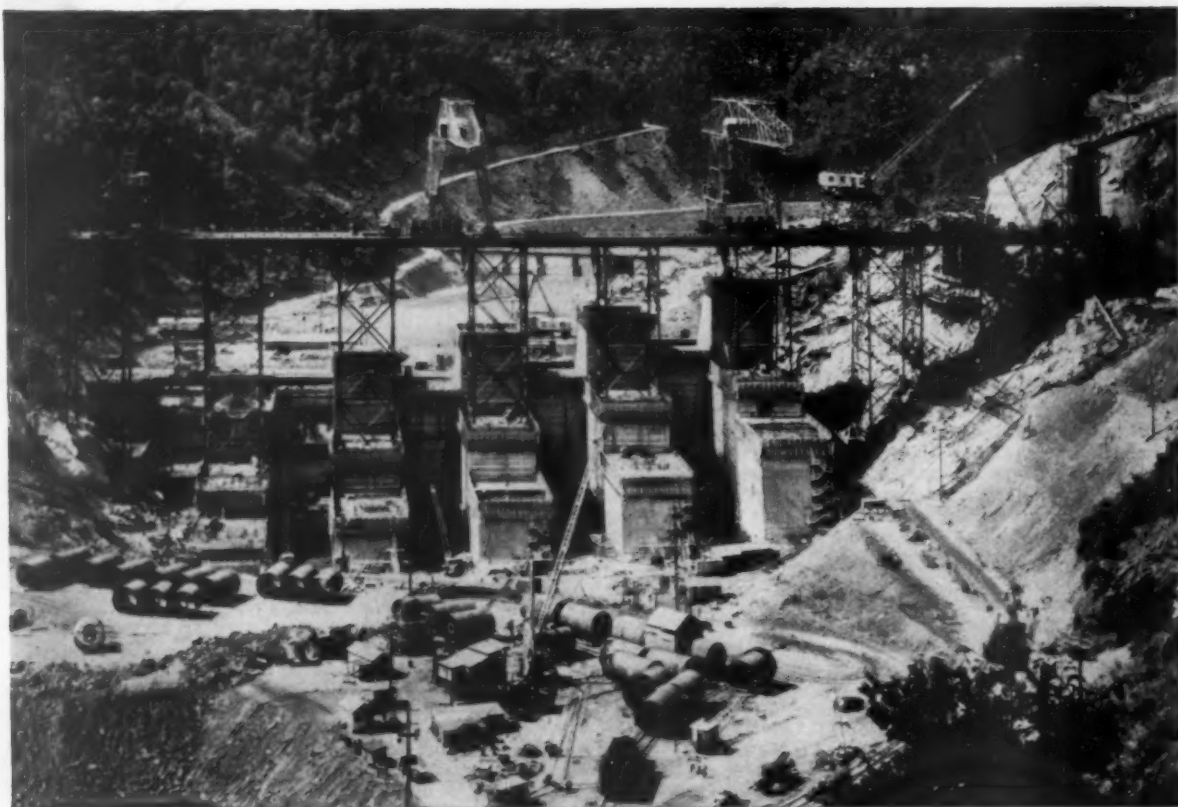
Under Mr. Sandles' able leadership the National Agricultural Limestone Association, with headquarters at Columbus, Ohio, gained the backing of representative producers in western Pennsylvania, Ohio, Tennessee, Michigan, Indiana and Illinois. A field man, C. R. Wagner, whom Mr. Sandles described as a genuine Ohio "dirt farmer" was employed. But, in spite of Secretary Sandles' efforts the Association's scope soon narrowed to promotional work in Ohio and western Pennsylvania, and its "National" significance became nil. It gradually passed out of the picture, but the Ohio producers have continued an organization up to the present time under one name or another.

When the U. S. Soil Conservation Service came into existence, some ten years ago, these differences in agricultural liming practices had to be recognized; and, as every producer knows, tremendous progress was made in getting farmers to use the material in some form. It would have taken a very successful national association many years to have accomplished as much by education and publicity, yet to this day only one-third as much liming material is being used, as should be used just to maintain present fertility of our soils for posterity.

The question then is: Are farmers sufficiently educated to continue to use and expand their consumption to three times present production of liming materials; or must they continue to be bribed to do so by subsidies or gratuities at the expense of all taxpayers? Most intelligent business men, who still believe in private enterprise, do not believe in government subsidies and all that follows in their train. On the other hand our soil, our most vital and irreplaceable national asset, must be preserved for those who come after us, if they are to eat.

Nathan C. Rockwood





## Cooling Concrete **120 TIMES FASTER!**

**H** EAT from hydration of cement in the 2,800,000 cu. yds. of concrete used in building TVA's Fontana Dam would normally take 40 years to dissipate completely. However, by circulating water—cooled by a 250-ton-per-day refrigeration plant—through pipes embedded in the concrete, the required cooling and shrinking was accomplished in two to six months, an average of 120 times faster.

Speedy completion of giant projects like Fontana is due not only to improved methods of cooling concrete, but also to improved construction machinery and improved lubricants designed to assure their maximum performance. In the development of lubricants, Texaco has played a leading role.

Texaco Alcaid, Algol or Ursa Oils in air compressors, to cite one example, assure wide-opening, tight-shutting valves, free piston rings, open ports, clear lines, continuous air supply. They also assure maximum service life between overhauls, fewer repairs and replacements. Their use in compressors is worldwide.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

### THEY PREFER TEXACO

- ★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.
- ★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.
- ★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.
- ★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.
- ★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.



## TEXACO Lubricants

FOR ALL AIR COMPRESSORS AND TOOLS

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

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### Pipe Assn. Director

HOWARD F. PECKWORTH, assistant to the secretary of The American Society of Civil Engineers, has been



Howard F. Peckworth

appointed managing director of The American Concrete Pipe Association with headquarters in the Builders Bldg., Chicago, Ill. T. J. KAUER, who has been assistant to the president and Washington representative of the pipe association, will be assistant managing director and will continue his office in the Munsey Bldg., Washington, D. C.

### Moves Office

M. W. LOVING, consulting engineer and concrete technologist, will move his office on April 1 from the Portland Cement Association, 33 W. Grand avenue, Chicago, to 228 N. La Salle street, Chicago. The American Concrete Pipe Association also will move its office to the same building. Mr. Loving, consulting engineer of the association, will have his office adjacent to the association quarters.

### Named Superintendent

F. GRAYSON MEYERS, chief engineer at the Portland, Colo., plant of the Colorado Portland Cement Co., Denver, Colo., has been promoted to superintendent of the plant. He replaces H. L. Lucas, who has been acting superintendent since the death of Mike Fleming in July of 1943. JOHN BAKER was named general mill foreman.

### Appointed Sales Head

FRED L. DOOLITTLE, assistant sales manager of the Pennsylvania-Dixie Cement Corp., New York, N. Y., has been appointed general sales manager to succeed B. W. Druckenmiller who was elected president of the corporation. L. L. VAN NEST, as-

sistant sales manager, has been made assistant general sales manager. FRANK J. SELINGER, Jr., who has acted in an executive capacity in the general sales office in New York City, was appointed director of dealer relations, and HUGH R. HAMILTON, for the past five years with the executive staff of the general sales department, is now assistant to the general sales manager.

Mr. Doolittle joined the company in 1929 as a clerk in the Boston office. For five years he was in the field as a salesman stationed at Springfield, Mass., before being made assistant district sales manager at Boston. In 1941 he was made assistant sales manager at New York City.

Mr. Van Nest became associated with the portland cement industry in 1927 and maintained headquarters



Fred L. Doolittle

at Pittsburgh, Penn., until 1941 at which time he was appointed by Penn-Dixie to the position of assistant sales manager, New York, N. Y.

Mr. Selinger is well known in the portland cement industry which he entered in 1907 and has served in many posts in the Middle West, the South and the East. He became associated with Penn-Dixie in 1930.

Mr. Hamilton has been identified with the portland cement industry since 1929. He joined Penn-Dixie in 1939 in the New York district sales office.

### Made General Manager

LAWRENCE J. VANDER HEYDEN has been made general manager of the Cities Fuel & Supply Co., Milwaukee, Wis.

### Joins Fluorspar Co.

C. E. RODHAM is now associated with the Rock Mountain Fluorspar Co., Albuquerque, N. M.

### Universal Plant Manager

PAUL KIRKBRIDE, assistant plant manager at the Independence, Kans., plant of the Universal Atlas Cement Company, has been appointed plant manager to succeed Charles M. Carman, who has resigned. Mr. Kirkbride joined the company in 1919 as engineer and assistant maintenance superintendent at the Northampton, Penn., plant. Two years later he was transferred to the Hannibal, Mo., plant as assistant general superintendent and remained there until he was assigned to the Independence plant.

### Crushed Stone Director

ANDREW L. HERSTER, who has been associated with the General Crushed Stone Co., Easton, Penn., for about 25 years, has been elected assistant treasurer and a director of the company.

### Heads Operations

ROBERT A. KINZIE, consulting engineer, Santa Cruz Portland Cement Co., San Francisco, Calif., has been appointed vice-president in charge of operations.

### Leaves Stone Co.

GEORGE J. FREDERICKS of Phalanx, N. J., president of the Consolidated Stone and Sand Co., Montclair, N. J., has resigned from the company after an association of 25 years.

### Retires

M. M. BALES, general superintendent of the Elmhurst-Chicago Stone Co., Elmhurst, Ill., has retired after 24 years of active service with the company. HERBERT E. MANAHL of Harvey, Ill., will succeed Mr. Bales as general superintendent.



M. M. Bales

## Research Director

GUY O. GARDNER, who since 1925 has been superintendent of the Chanute plant of the Ash Grove Lime and Portland Cement Co., Kansas City, Mo., has been promoted to the position of manager and research director of all the company's plants in Kansas, Missouri and Nebraska. This announcement was made by L. T. Sunderland, president of the company. Mr. Gardner joined the Chanute plant in 1912 as a chemist and held that position until 1917 when he became assistant superintendent. In 1925 he was made superintendent.

KENNETH W. WRIGHT, who has been assistant superintendent at the Chanute plant since 1925, will succeed Mr. Gardner as superintendent. Mr. Wright started in the engineering department of the plant in 1917. He enlisted in the Army in August of that year, but returned to the plant in 1919 at the end of the first World War. In 1925 he was promoted to the position of assistant superintendent.

ANDREW K. PROLICH and ANDREW LUNDTTEIGEN, JR., both of Louisville, Neb., and former employes in the engineering department of the plant, have also been promoted. Mr. Prolich has been advanced to chief engineer of all plants, and Mr. Lundteigen has been made chemical engineer and assistant superintendent.

## Fluorspar President

N. J. NICHOLSON of Denver, Colo., has been elected president of the Chaffee County Fluorspar Corp., Salida, Colo., succeeding Sam Sclavenitis. TOM POLITZ of Salt Lake City, Utah, was reelected vice-president. PETER L. BANCROFT will continue as secretary-treasurer of the company and general manager of the mine and mill in Browns Canon. Directors of the corporation for the coming year are Theodore Anderson, Sam Sclavenitis, Karl Rahy and John A. Hall. Opening of the company's new flotation mill was celebrated recently.

## Named Director

W. D. EDWARDS, vice-president of the National Lime and Stone Co., Findlay, Ohio, has been elected a director of the Aro Equipment Corporation.

## Engineering Organization

HENRY J. KAISER has been named president of Kaiser Engineers, Oakland, Calif., an organization composed of engineers long associated with him and responsible for the design and construction of some of the world's outstanding projects. E. E. TREFETHEN, JR., and T. M. PRICE are vice-presidents, and GEORGE HAVAS, vice-president and general manager. The company will undertake engineering work in any part of the

world and includes qualified engineers in all of the major fields of engineering—civil, hydraulic, structural, mechanical, electrical, architectural and metallurgical. GEORGE W. VREELAND will serve as chief consulting engineer and GEORGE B. SCHEER as chief consulting electrical engineer.

## Gypsum Manager

CLARENCE E. ANDERSON, assistant manager of the National City, Mich., plant of the National Gypsum Co., Buffalo, N. Y., has been made manager of the plant, succeeding H. B. Brockenbrough, who has retired. Shortly after the outbreak of the war, Mr. Anderson served as nitrate superintendent at the Bluebonnet bomb plant. Later he was transferred to the National City plant as assistant to Mr. Brockenbrough. Mr. Anderson's father, the late Herman Anderson, was manager of the Fort Dodge plant at the time of his death in 1943.

## Remains with W.P.B.

ARTHUR S. KNOIZEN, who decided recently to resign from the Mining Division of the War Production Board to return to private practice, has reconsidered his decision and will stay on as director of the Mining Division.

## Yosemite Appointment

E. T. WYLIE has been appointed secretary and treasurer of the Yosemite Portland Cement Corp., San Francisco, Calif., to succeed A. H. Van Slyke, secretary, and C. M. Chapman, treasurer.

## From Safety to Sales

MANNING P. GREER, who has been safety director of the Marquette Cement Mfg. Co. plant at Cape Gir-



Manning P. Greer



Anderson Hayden

ardeau, Mo., has left this position to become connected with the sales department. He will work out of the Chicago sales office but his territory will be in southern Illinois. Mr. Greer is widely known in the cement industry for his safety work, which has extended over a period of 20 years with this company.

ANDERSON HAYDEN, who has been his assistant for two and one-half years and an employee of the Cape Girardeau plant for 12 years, will succeed Mr. Greer as safety director.

## Universal Appointments

JOHN P. CAMM, plant manager of the Leeds, Ala., plant of the Universal Atlas Cement Company, has been appointed plant manager of the Osborn, Ohio, plant, which was recently purchased from the Wabash Portland Cement Co., Dayton, Ohio. W. O. Lawrence, assistant plant manager at Leeds, will be acting plant manager. HAROLD R. CURRIE, former purchasing agent, secretary and treasurer of the Wabash Portland Cement Co., has been appointed local auditor of the Osborn plant.

## Gypsum Director

CHAMP CARRY, executive vice-president of the Pullman Company, has been elected a director of the United States Gypsum Co., Chicago, Ill. He succeeds M. H. Basquin, who has resigned. W. B. McMillan, Solomon A. Smith, J. W. Fowler, and W. A. Avery, brother of Sewell L. Avery, chairman of the board, were re-elected directors of the company.

## Goes to Brazil

S. G. MCANALLY, former superintendent of the Pennsylvania-Dixie Cement Corp. plant at Clinchfield, Ga., has taken a position with Cio Cimento Brasileiro, Brazil, S. A., to construct and operate a cement plant.

## Agstone Association Set-Up

MORE DETAILS are now available concerning the recently organized National Agricultural Limestone Association, Inc., New York, N. Y. Persons and firms engaged in production, and one production or sales executive of any producer not a member, are eligible for active membership. Associate memberships are available to sales and production executives of a producer holding an active membership or having a sales or production executive who is an active member; those who sell or distribute, but do not produce agricultural limestone; and manufacturers of machinery, equipment or supplies used by the industry.

Annual dues of active members are \$10 on production not over 25,000 tons; \$20 on production of 25,000 tons and not exceeding 50,000 tons; and \$50 on production exceeding 50,000 tons a year. Associate members who represent producers pay half the dues of active members; agricultural limestone distributors pay \$5 annually; and dues of manufacturers will be determined by the executive committee.

Standing committees of the association include: an Executive Committee, Legislative Committee, Traffic Committee, Finance Committee, Membership Committee, and Audit Committee. Executive officers other than the secretary will not receive any compensation. There will be five regional vice-presidents: Region 1, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania; Region 2, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio and Wisconsin; Region 3, Delaware, Maryland, Virginia, West Virginia, North Carolina, Kentucky and Tennessee; Region 4, Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, and Texas; and Region 5, California, Oregon, and Washington.

Research and advertising and publicity services are planned by the association. One of the proposals is to compile a compendium prepared in non-technical language to inform the industry and public concerning the part agricultural limestone plays in the maintenance of nutritional standards, public health and national economic welfare. Officers of the association in the organizational setup were listed on page 52 of the March issue of Rock PRODUCTS.

## Buys Gravel Concern

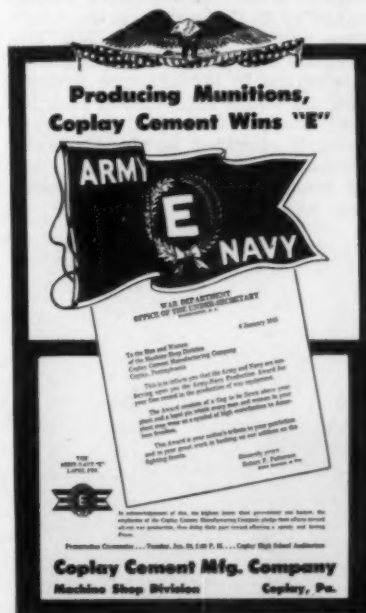
INDEPENDENT GRAVEL Co., Joplin, Mo., with 11 plants at 10 locations in four states, has been purchased by Guy H. Waring, widely-known mine operator, from L. R. Reynolds and the Ben D. Reynolds estate. It is said that the deal involved about

\$300,000. The company has chat and asphaltic plants at Webb City; chat plants at Picher and Treece; limestone plants at Carthage, Hannibal, Collins and Louisiana in Missouri, Marble City, Okla., and Sulphur Springs, Ark., and a tripoli plant at Racine, with a quarry at Seneca. Ben D. Reynolds, who was one of the founders and active head of the company for many years, died recently. Robt. D. Toutz, vice-president and general manager, and Earl C. Toutz, secretary and assistant treasurer, also were identified with the company for many years.

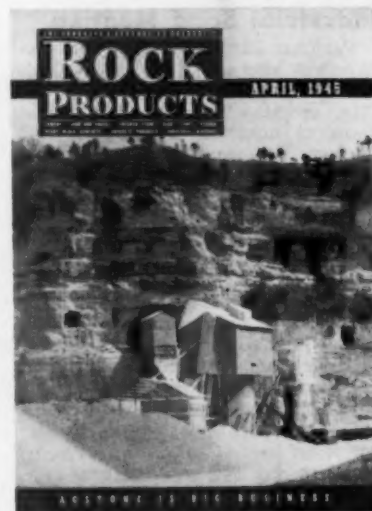
## Coplay Wins "E" Award

COPLAY CEMENT MANUFACTURING Co., Coplay, Penn., has been directly engaged in war work for more than two years producing shells in its well-equipped shops, and just recently was given another big contract by the Philadelphia Army Ordnance district. To further facilitate its war activities the company has applied for a change of name and amendment of corporate purpose of its subsidiary, the Saylor Portland Cement Co., to the Coplay Ordnance Co. Company officials will remain the same for both concerns.

Brief mention was made on page 55 of the February issue of Rock PRODUCTS concerning the Army-Navy "E" award, but news of the company celebration was not available. The illustration shows the company advertisement, announcing the award. Ceremonies were held in the auditorium of the Coplay High School with a large representation of employees, guests, and military and naval



Newspaper advertisement of Coplay Cement Manufacturing Co., announcing the winning of the Army-Navy "E" award



Cover illustration of this issue shows the Prairie du Rocher, Ill., plant of Columbia Quarry Co.

officials present to honor the employees and the company for their excellent record. D. J. Uhle, vice-president of the company, accepted the award which was made by Lt. R. J. Nordstrom of the Navy assisted by Private Lee Argadine of the Army, wounded in the Mediterranean theatre. Max E. Grunewald, president of the company, made the address of welcome.

## Expands Operations

FENTON CONSTRUCTION Co., Ashland, Ohio has purchased the Bowman Washed Sand and Gravel Co., with main offices in Troy, Ohio and plants at Urbana and Piqua. Harold Pittman will be in charge of the recently purchased properties which include a gravel plant, ready mixed concrete, and asphalt plants. Mr. Bowman has operated in Troy, Ohio since 1923.

## Form Mica Firm

CUSTER NON-METALLICS, Custer, S. Dak., has been formed as a partnership by Hubert O. De Beck, Mrs. Gladys Wells and Kem Koch. Mr. De Beck was formerly technical assistant to the president of Colonial Mica Corporation, and more recently was field engineer and western manager for the company.

## Pavement Yardage

AWARDS of concrete pavement for February, 1945, have been announced by the Portland Cement Association as follows:

	SQUARE YARDS AWARDED	
	During February, 1945	During 1st Two Months, 1945
Roads .....	19,674	361,984
Streets and alleys ..	98,039	285,317
Airports .....	708,075	1,248,611
Total .....	825,788	1,895,882



## Industrial Sand Meeting

NATIONAL INDUSTRIAL SAND ASSOCIATION will hold its annual meeting at the Hotel New Yorker, New York City, on May 23 and 24. Original plans to hold the meeting at Hot Springs, Va., were cancelled by the board of directors in favor of the New York meeting. V. P. Ahearn, executive secretary of the association, in announcing the meeting stated that war-time problems with particular reference to transportation and manpower difficulties made it necessary to hold a meeting of the entire membership. As registration at these annual meetings never has exceeded 50 people, this meeting does not come under the Byrnes ruling banning conventions.

## Moves to New Quarry

THE UNITED STATES LIME PRODUCTS Co., San Francisco, Calif., has moved its mining operations at Sloan, Nev., to a new quarry located near Apex, Nev., on the Salt Lake highway. Due to the heavy overburden of dolomite encountered in recent operations, it was no longer profitable to mine the high calcium limestone at Sloan where quarrying had been carried on for over 25 years. Both rail and truck facilities will be used to haul the rock to the company's mill at Sloan.

## War Hits German Plants

IT IS NO SECRET that cement plants and other rock products industries of Germany and other Nazi controlled countries have been military objectives of first importance. Cement plants ranked with ordnance plants as prime bombing objectives because fortifications and military highways called for vast quantities of cement. In the accompanying illustration is shown the cement plant formerly operated by Wicking'schen Portland Cement und Wasserkalkwerken A. G. at Neuwied, Germany, on the Rhine river just north of Coblenz, which has been very much

in the current war news. This plant undoubtedly has been bombed repeatedly, and may actually be directly in the fighting zone when this is published.

## Fluorspar Mill Opened

CHAFFEE COUNTY FLUORSPAR Co., Salida, Colo., recently opened a new fluorspar mill in Brown's Cañon. Sam Schlavenitis, Denver, Colo., is president of the new company; Peter L. Bancroft is secretary-treasurer; Axel Johnson is in charge of the mill; and Hugo Bryan is in charge of the mine. This is the fourth mill built in this district, but only three are now in operation.

## Pay Too Much—Pay Fine

FOUNTAIN SAND & GRAVEL Co., Pueblo, Colo., paid a penalty of \$1,000 for making alleged unauthorized wage payments of \$19,327.99 to 24 employees, according to a recent decision of a tripartite enforcement division of the War Labor Board. It held that the company had granted wage increases without approval of the W.L.B. The company issued a statement that "there is not a single violation created under the Act. The company had ample proof that raises were justified due to former wages paid other employees in the same classifications. Rather than go through the W.L.B. procedure to explain these alleged violations, the management decided to accept the penalty of \$1000 deductible from income taxes."

## Lease Quarry

CONCRETE MATERIALS Co., Cedar Rapids, Iowa, has leased the quarry owned by E. C. Gooden on the Platte river north of Ravenwood, Mo. The company plans to open up the quarry this spring to manufacture agricultural limestone and crushed rock for road construction. This quarry was formerly operated by the McDowell Company of Kansas City, Mo., but the lease had been relinquished some time ago.

## New Quarry Owners

GREENSBURG STONE Co., Greensburg, Ind., has been sold by Darrell G. Rhodes to Paul Huber and Arl Doty, who will operate quarry and crushing plant under the name of Paul Huber-Arl Doty, engineers and constructors. Mr. Huber and Mr. Doty also are in the black-topping business and the two enterprises will be operated as one company. Arl Doty will have charge of road construction and the operation of the quarry, and Paul Huber will be in charge of the office, bidding, engineering, etc., as he is a licensed civil engineer. Edward Lawrence, Jr., will be quarry foreman. Plans are under way to increase production at the stone plant to take care of the increasing orders of road stone and agricultural limestone.

## Acid-Grade Fluorspar

RECENT reports indicate a possible shortage in acid-grade fluorspar, largely due to lack of suitable ore rather than manpower. This grade is in big demand for the manufacture of hydrofluoric acid used in the production of high-octane gasoline. Four new concentrating plants will be placed in operation to make acid-grade spar from low-grade ore. This ore, which will come largely from Mexico, will involve costly operations that will have to be subsidized by the federal government.

## Ready Mix Record

READY MIX CONCRETE COMPANY's plants at Oahu, Hawaii, have produced 958,554 cu. yds. of concrete since Pearl Harbor, according to J. J. Makin, manager of the company.

## Large Earthmovers

COLUMBIA QUARRY Co., St. Louis, Mo., will soon place into service at its Krause, Ill., plant four earth-moving units to replace trucks in the disposal of overburden. Two LeTourneau Tournapulls with 14-cu. yd. Carryalls will haul the topsoil and two similar units with 12-cu. yd. rock wagons will handle top rock. Each machine is powered by a 150-hp. Cummins Diesel engine. Topsoil ranges from 0 to 25 ft. in depth and top rock up to 55 ft. thickness must be removed.

## To Build Lime Plant

GYPSUM, LIME AND ALABASTINE Co., of Canada, Ltd., Toronto, Ont., is reported to have placed contracts for a plant at South Westminister, B. C., which will cost \$500,000.

## Ready Mix Plant Permit

MOORMAN SAND AND GRAVEL Co., Middletown, Ohio, has received a permit to construct a ready mixed concrete plant to cost about \$12,000.



Overall view of the cement plant at Neuwied, Germany on the east bank of the Rhine river just north of Coblenz



## Plant Trees for Fuel

Antonio Perreira Ignacio, a shoemaker who became Brazil's outstanding industrial leader and manufacturer of lime and cement, is noted for his company's innovations

By VICTOR J. AZBE



Antonio Perreira Ignacio, the "grand old man" of industrial Brazil

THE ANGLO SAXON is inclined to consider himself as a sort of an Industrial Superman, and, when one travels the Latin-American countries, noting the many American and British managed industries, such ideas become further reinforced. But, while foreign investments through all these countries are very great, made possible through capital and the back-log of technical talent

available, the Latin himself also is capable of creating great industrial combinations. An outstanding and inspiring example of such men is Senor Antonio Perreira Ignacio.

This 70-year-old gentleman arrived in Brazil from Portugal at the age of sixteen. He was a shoemaker and for many years he was active as just a repairer of shoes. One is inclined to wonder what was passing through his mind while sitting there on his three-legged stool. Did he even then have ambitions and possibly visions which helped to carry him along?

While Antonio Perreira Ignacio, we may say, never really lost interest in shoe-making and his stool is a prized possession, on which today he could earn a shoemaker's wage, the

opportunity within its reach was too limited for his ambitions. This first of many notable steps was when with a capital of 3000 millreis, or \$150, he expanded into the buying and selling of cotton from which developed the first small cotton mill. The number expanded continually, until today there are ten spread over the country, buying and preparing cotton for spinning.

These many cotton plants were supplemented by others where cotton seed was converted into edible oil and soap, hull fiber for paper mills, linters for textile mills, stearin for candles and cotton seed meal cake for cattle food.

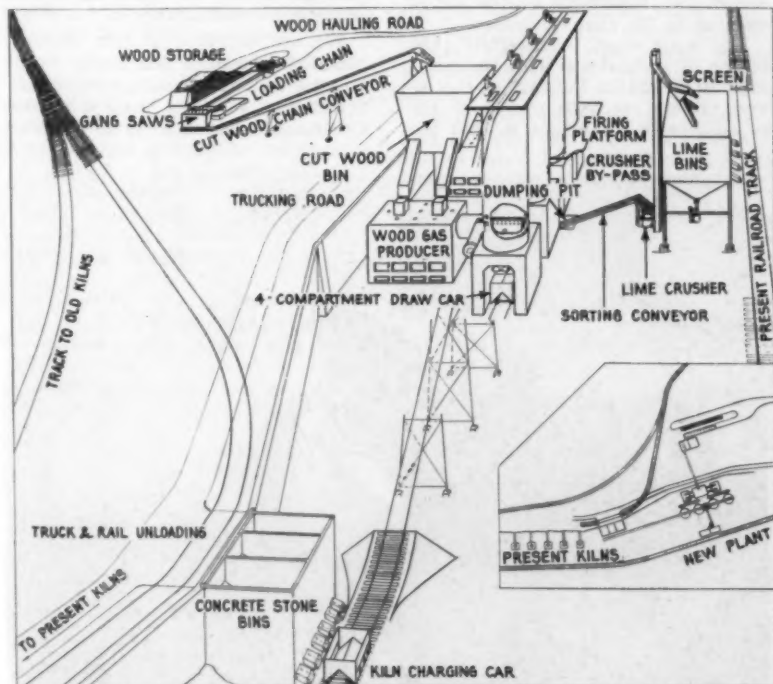
In 1918, a textile mill was acquired in the small town of Votorantim, by which name the company is now known. This latter grew into an immense plant with a capacity of 500,000,000 sq. ft. of fabric and employing 5000 people.

But his mind was not to be confined to only one line of endeavor. So, a match factory was built, a brick plant, a real estate company was organized, and then a subsidiary, the Siderurgica Barra Mansa was formed, operating three charcoal blast furnaces and one open hearth steel furnace. The latter now is preparing to install a rolling mill.

But what interests us most is the evolution of this active-minded Portuguese shoemaker in the rock products field. In 1918, when the Votorantim textile mill was acquired, a lime plant of the most obsolete type came with it, but obsolete as it may have been, it served the purpose of starting him in the rock products field in which he, as his nature dictated, was bound to prosper.

So a few years later he bought a very old cement plant, consisting of several vertical mixed feed kilns, of a type which even today are still used in some parts of the world. But that was only a step, as everything in his case seemed to be a step to something bigger and better. In 1937,

(Continued on page 120)



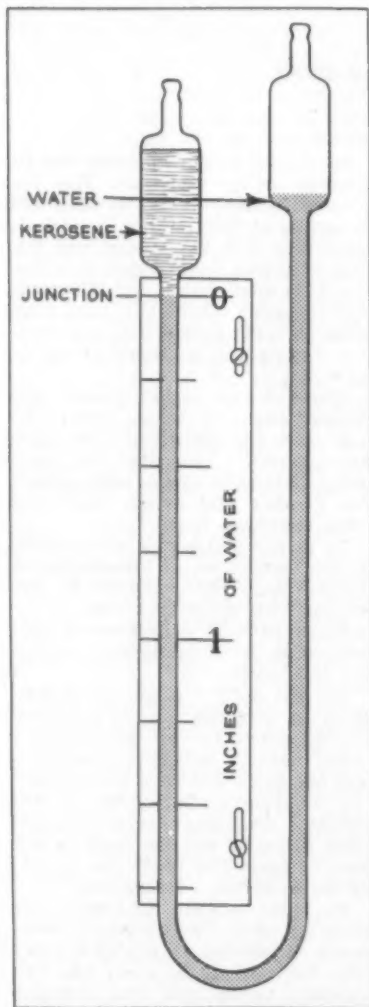
Wood-fired, gas producer lime kiln installation (Azbe system) designed for S. A. Industrias Votorantim, Santa Helena, Sorocaba, Brazil

# HINTS *and* HELPS

Practical Ideas Developed by Operating Men

## U-Tube for Low-Pressure Gas Measurements

WHERE small differences of pressure in low-pressure gas or air systems have to be indicated, the ordinary U-tube is not satisfactory be-



U-tube designed to accurately measure small differences of pressure in low-pressure gas or air systems

cause it cannot be read with precision.

An improvement in the simple U-tube in this respect is the compound type illustrated. This is a U-tube several times as long as that normally required, and has near the top of each leg an enlarged portion of suitable size. The tube is filled with (paraffin) kerosene on one side and with colored water on the

other, in such amounts that the junction of the two liquids is just below one of the enlargements but in the true bore of the narrow tube.

If pressure is applied to the kerosene side, or if suction is applied to the water side, the other leg in either case being open to the air, the liquid levels in the wide portions will move accordingly, but the junction of the liquids will travel a distance greater than this in proportion to the respective areas of the wide and narrow portions.

For example, if the wide tube is 1-in. diameter and the narrow tube  $\frac{1}{4}$ -in. diameter internally, the area of the former is 16 times that of the latter and  $\frac{1}{16}$ -in. difference in pressure in the wide tubes will move the liquid junction approximately 1 in.

Such tubes can be made quite cheaply by laboratory equipment manufacturers, but care should be taken that the essential parts are reasonably uniform in bore. The length of the narrow tube will obviously depend on the range of pressure to be dealt with, coupled with the selected proportions of the wide and narrow tubes. Red ink is a suitable coloring medium for the water. The end of the tube exposed to the air should be protected against the entry of dust in a manner which allows free movement of the air in and out as the gage fluctuates.

The scale must be carefully calibrated by comparison with the readings of a direct-indicating U-tube and marked accordingly. It should be adjustable for height so that the

zero and junction can be brought into register following re-filling or as evaporation occurs. If the best possible appearance is desired, the scale can be turned 90 deg. so that the tube is "edge-on," the portion visible being confined to the area of the scale.

## Spread Agstone with Mixer Trucks

In the accompanying illustration is shown a mixer truck operated by Western Sand and Gravel Co., Spring Valley, Ill., which has been adapted to spread agricultural limestone. This company is a large sand and gravel producer and ready mixed concrete distributor, but with the present drop in demand for concrete has turned its idle equipment to a very urgent and practicable use. While mixer trucks are rather expensive equipment to be used for the spreading of agstone, their use has helped out in an emergency when it has been difficult to obtain standard spreader machinery.

It will be noticed that a grain seeder has been hooked onto the rear of the mixer truck to do the actual spreading, and the agstone is chuted from the mixer drum into the seeder box as needed. This arrangement has the advantage of reducing flying dust to a minimum.

We are indebted to Rus Ruffner, superintendent of La Salle Stone Quarry for the picture and to Mr. Sitterly of Western Sand & Gravel Co., for permission to print it.



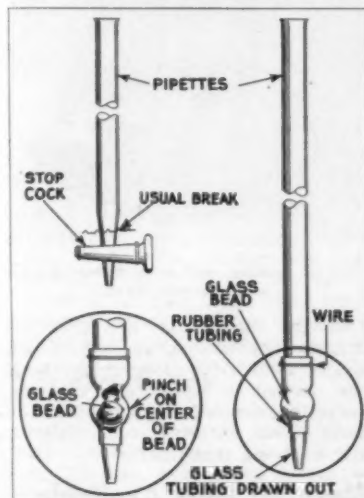
Ready mixed concrete truck and grain seeder hook-up to spread agricultural limestone

# Salvaging Broken Pipettes

by JOHN F. PRUYN

ONE of the items in the laboratory which is subject to breakage is the pipette. The war has not reduced the breakage, but it has made replacements a lot harder. Illustrated herewith is a method that has saved the day for several distraught laboratory workers. The broken pipette can be made into a very serviceable unit with one added feature that makes it superior to the one equipped with a glass petcock; namely, it won't clog.

The arrangement is very simple. A glass bead is inserted into a piece of



Showing how pipette has been salvaged for use after it had been broken

rubber tubing and a piece of drawn-out tubing is attached. This home-made petcock is operated by merely squeezing on the middle of the bead. Any degree of flow can be regulated.

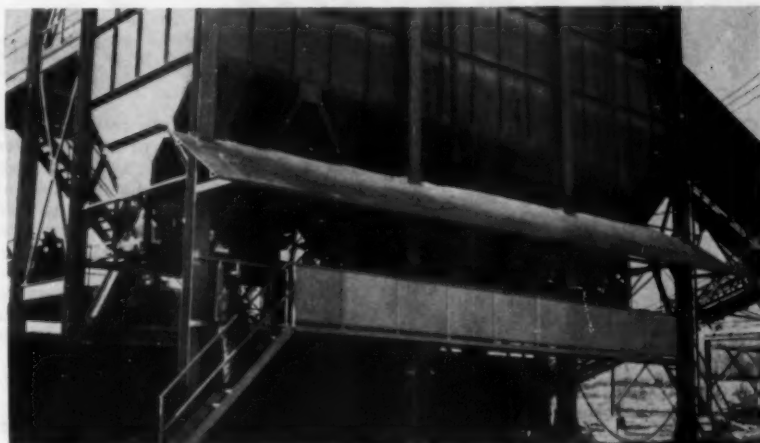
If no glass beads are available, they can be made by simply rotating a small glass rod, around minus  $\frac{1}{8}$ -in., in a flame. When a bead of the required size forms, break it off.

## Car Puller

Using the worm gear drive from an old dragline, the Gifford-Hill Co.,



Old dragline worm gear drive converted into car puller



Showing widened crushed stone loading platform, guard rails, new steps, and an overhead roof to protect workmen

plant at Grand Prairie, Texas, built a freight car puller which does a satisfactory job. A 5-hp. motor with V-belt drive to a shaft through the gear powers the car puller. The cable on the hoist is  $\frac{3}{8}$ -in. diameter.

## Safety Platform for Screening Plant

WARNER Co., Philadelphia, Penn., has taken justifiable pride in its safety accomplishments, and has done everything possible to stimulate safety suggestions from its employees. In a recent issue of the *Green Diamond*, published by the company, there was published an illustration showing how the crushed stone loading platform at the Cedar Hollow quarry, Devault, Penn., had been improved from the standpoint of safety.

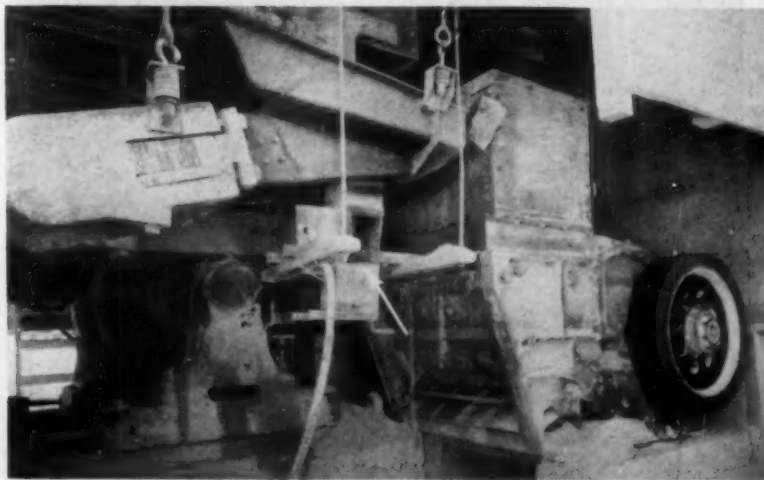
As may be noted in the illustration, the platform has been widened and equipped with guard rails, new steps, and an overhead roof. The

original platform was narrow, reached by a ladder with a very narrow clearance to the railroad track, permitting stone and rain to fall on the men.

The present structure provides steps at each end of the platform, on which Camillo Melchiorre, assistant quarry foreman, is shown standing in the left foreground. This improvement was suggested by the men working at the plant, and was brought to the attention of the Cedar Hollow Safety Committee by George Gruhl, foreman.

## Heating Conveyor Pan

COLUMBIA QUARRY Co., St. Louis, Mo., has a unique agricultural limestone pulverizer arrangement at its Krause No. 1 plant which is shown in the illustration. An electric vibrating feeder regulates the flow of stone from an overhead bin into the pulverizer. Under the feeder pan is a fire-box for a coal fire to keep the conveyor pan from gumming up when the stone is wet.



Fire-box for coal fire (see arrow) is located under pan of electric vibrating feeder which regulates flow of stone from overhead bin into pulverizer



# NEW Machinery

## Charger for Flashlights

THE B. F. GOODRICH Co., Akron, Ohio, has announced a single unit charger for its recently introduced rechargeable wet flashlight storage battery which can be operated from the ignition system of automobiles, trucks, buses, tractors, boats or airplanes.

Designed for easy attachment on the dash, cowl, side panel, or other convenient places on the vehicle, the charger may be connected so that it does its work with the vehicle either running or idle. For charging while the vehicle is not in use it is attached to the "live" side of the ignition system. It operates on six volts and 12 volts, direct current.

## Improved Air Compressor

THE JAEGER MACHINE Co., Columbus, Ohio, has announced that it will continue in production after the war a complete line of both portable and stationary models of air compressors from 60 to 500-cu. ft. capacity, now being built for war purposes.

By balancing the low and high compression cylinders in a "W" shaped bank and micro-honing and lapping in parts to close automotive tolerances, the resulting efficiency is said to permit full rated output of air with 20 to 30 percent lower piston speed and the power plant operating well below its capacity at any altitude in the United States.

Air-actuated valves of large size

and high lift insure free air flow without back pressure. By this valve action, in combination with improved cylinder radiation and more efficient intercooling, air compressed to 100 p.s.i. is held to a temperature within 100 deg. of the ambient atmosphere. Condensation and oil vapor are controlled by automatically unloading and draining the corrosive fluid from the intercooler system during each idling period.

## Core Bit Reaming Shells

CARBOLOY COMPANY, Inc., Mining Division, Detroit, Mich., is now carrying in stock reaming shells for use with diamond core bits, the shells being provided with a series of "Sinta-Set" diamond impregnated carbide inserts designed to increase core bit life.

It is claimed that the inserts, brazed into recesses around the periphery of the reaming shells, maintain gauge during the entire useful life of the bit. When the original bit is replaced, it is said no further reaming in the drilled hole is required. Each insert is impregnated throughout one-half of its thickness with West African bort.

Three or four inserts are mounted around each shell, according to the size of the reamer. As repeated use wears the inserts and reduces them in size, the reaming shell can be brought back to its proper diameter by heating the inserts with a torch until the braze metal has melted;



Core bit reaming shells with diamond-impregnated carbide inserts

removing the inserts; and then re-brazing the inserts on top of the shims. Four sizes of reaming shells are carried in stock: EX, carrying three inserts; AX, carrying four inserts; BX, carrying four inserts; NX, carrying four inserts.

## Blueprint Book Available

STEARNS MANUFACTURING Co., Adrian, Mich., manufacturers of concrete products machinery, is sending the book "Practical Blueprint Reading," as a gift to all concrete masonry producers. In the words of Gene Olson, president, "A lot of our boys found this lesson course a helpful refresher on blueprint reading. If it helps the concrete masonry plant men as much—it will help the industry." Attempts were made to mail this book to all block producers but some plants may have been missed. As long as the supply lasts, the company will send a free copy of this book to anyone in the industry who writes for it.

## Synthetic Rubber Latex

UNITED STATES RUBBER Co., New York, N. Y., has announced the development of a new synthetic rubber latex at the federal government's synthetic latex plant at Naugatuck, Conn. This latex is a modification of the butadiene-styrene type of synthetic rubber. Advantages claimed for this latex are great uniformity and more easy handling and shipping. It mixes well with other ingredients, and is therefore very easily compounded for uniform viscosity and other desired properties.



Portable compressor which can be obtained in gas, Diesel, or electric powered models



## Work Positioner

RANSOME MACHINERY Co., Dunellen, N. J., has brought out a hand-operated positioner to facilitate repair welding and overhauling. It is said to be especially adaptable for stelling and other hard-surfacing of



Bench model positioner for welding

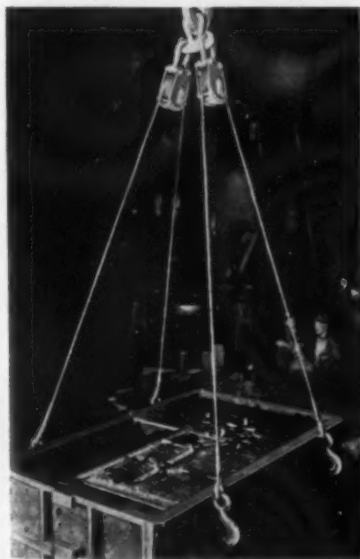
worn out construction equipment parts.

Model 1H, shown in the illustration, is a bench model of 100 lb. capacity with the center of gravity 3 in. above table. It has a tilting range of 150 deg., revolves 360 deg., and can be locked in position at any degree of tilt. The 16-in. table top is equipped with 9/16-in. slots. A swivel base is available if desired.

## Leveling Slings

MACWHYTE Co., Kenosha, Wis., has brought out a complete line of Caldwell "level-lift" slings made in 3/4-ton, 1 1/2-ton, 3-ton, and 6-ton capacities.

The operation is simple. After the lightweight block containing wire rope is put on the crane hook, the crane operator spots the crane hook over the approximate center of grav-

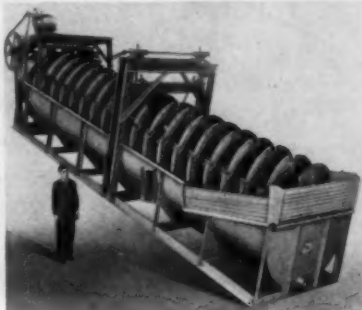


Sling which has been found particularly useful where loads must be lifted level. Illustration shows pair of slings handling a foundry flask

ity of the load and the floormen attach the sling to the load. The crane operator then applies the power to lift the load and as the crane hook is lifted, the rope automatically adjusts itself through the "level-lift" block. In so doing, one sling leg of rope becomes longer than the other, and as the weight of the load pulls on the wire rope, the sheave in the block pulls down against a brake which prevents slippage. The load is then lifted level.

## Cross-Flow Classifier

DENVER EQUIPMENT Co., Denver, Colo., has developed a classifier which derives its name from the "cross-flow" principle of operation. The overflow weir is on the side opposite the feed, rather than on the end of the classifier, and the conveyor



Cross-flow classifier has overflow weir on side opposite the feed

flights are in line with the direction of pulp flow across the classifier.

With this type classifier, the lower bearing is placed somewhat below the middle of the shaft, but above the maximum pulp level, thereby eliminating bearing trouble from sandy pulp, states the manufacturer. The cross-flow classifier is made in eleven sizes from 6 in. to 60 in., and seven duplex sizes from 24 in. to 60 in.

It is said that this classifier is particularly applicable to closed circuit, wet grinding with a ball mill, separations being made at from 20 to 100-mesh sizes. The classifier also is adaptable to sand-slime separations, dewatering, and continuous counter-current washing.

## Vertical Sludge Pump

CLAUDE B. SCHNEIBLE Co., Detroit, Mich., has designed a reliable vertical discharge pump similar to its horizontal type. These pumps were developed originally for use in connection with this company's wet-method dust collecting dewatering systems. In this service, abrasive sludge has to be pumped. It is claimed therefore that these pumps are particularly adapted for handling slurries, sludges, abrasive materials and dirty water. The pumps are available in sizes from 3/8-in. to 1 1/4-in.



Vertical pump has four discharge positions

The drive shaft of the pump is totally enclosed and is protected by a quill tube which serves as a structural member which is secured to the mounting plate and the housing top. The impeller is readily accessible, and the bottom of the pump housing is easily removed for the replacement of wearing parts. A venturi type discharge is said to assure constant head pressure.

## Blasting Cap Improvements

E. I. DU PONT DE NEMOURS & Co., Wilmington, Del., has announced that all electric blasting caps now being produced by the company have two improvements; nylon-insulated wires and rubber plug closures.

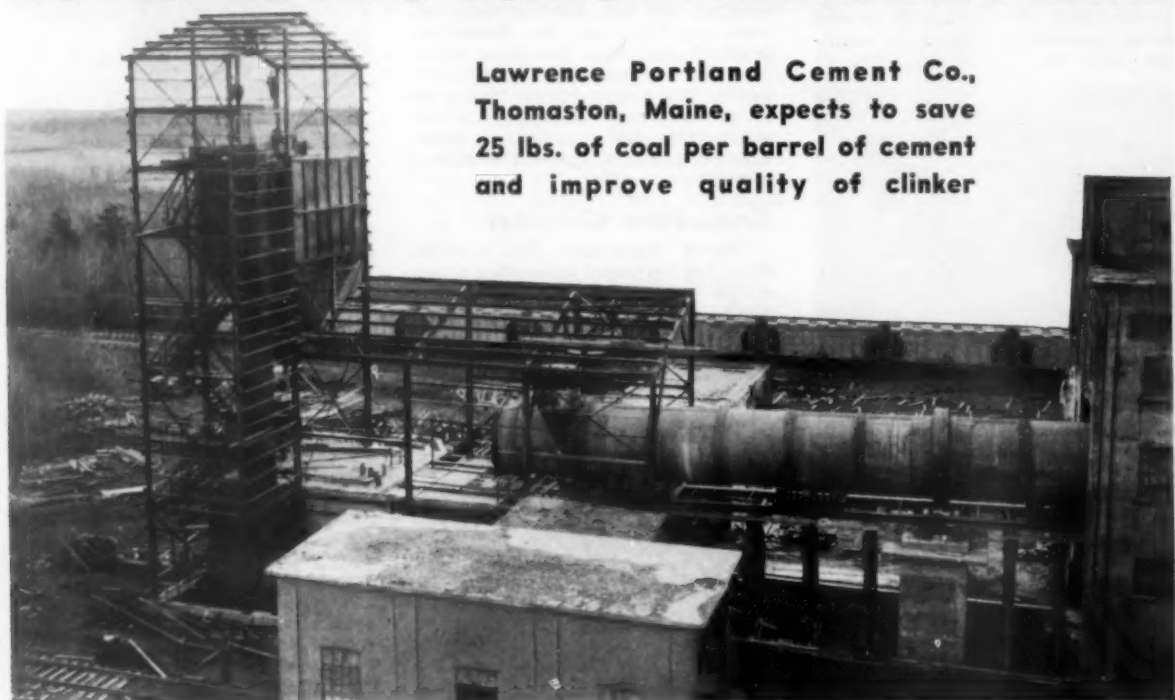
The wire covering of tough, abrasion-resistant nylon is said to be the equal of enamel insulation in preventing current leakage. It is not affected by extreme or rapid changes in temperature, states the manufacturer, and is in brilliant colors, minimizing the possibility of error in connections. Rubber plug closures, double-crippled in the shells, replace the combination of bridge plug, asphaltic water-proofing and sulphur seal, thus increasing resistance to water penetration. The new shells are much shorter than the old type but explosive strength has not been sacrificed. Priming is made easier and safer.

## Blow Guns

THE B. F. GOODRICH Co., Akron, Ohio, has added to its line of industrial hose a complete series of Lonn blow guns, whose fingertip-control is made possible by the use of rubber.

# Calcination

## Combine Two Cement Kilns into One



Showing steel erection progress of kiln building extension to accommodate longer kiln. No. 1 kiln has been moved into place. Note trestle work and cradles on which kiln rests

**T**O OBTAIN a substantial fuel saving and improve cement quality, the Lawrence Portland Cement Co. started reconstruction of the kiln department in June, 1944, at its Thomaston, Maine, plant. This work involved a change from two-kiln to one-kiln operation and other improvements. The change also will enable the plant to balance the operation to better advantage with a consequent overall saving in critical labor.

When built in 1927, the plant had two 11- x 200-ft. kilns, fired with pulverized coal from a bin system, and clinker discharged into 10- x 90-ft. rotary coolers. The coal mill, housing a dryer and two pulverizers, scales and coal feeders, was attached to the east end of the kiln building and in line with the kilns.

In 1940, direct-firing was substituted for the bin system, using two Raymond bowl mills, eliminating the old dryer and pulverizers. This change also terminated the use of the coal mill building except to house the coal bunker and necessary conveyors.

The plant will continue to operate by the wet process with two Allis-Chalmers compeb mills for raw grinding and with Oliver disc filters to reduce the moisture content of the slurry from 37 to 18 percent.

### Join Sections of Two Kilns

Before making this change, various possibilities were studied in the use of existing equipment. It was finally decided to join sections of the two 11- x 200-ft. kilns to make one kiln 11- x 356-ft. long, with an F. L.



Moving No. 1 kiln to new position, looking toward burner floor

Smidth modified chain system, and to replace the rotary coolers with a Fuller inclined movable grate cooler. The Raymond bowl mills will be continued in use for direct-firing, but as one of these mills would, under normal conditions, supply enough fuel for the single kiln the other will act as a standby.

The extended kiln is believed to be the longest kiln in the world fed with filter cake, and the great length coupled with the use of an elaborate system of heat recuperating chain loops suspended in the feed end of the kiln, are the principal reasons for the expected coal saving. A much lower stack gas temperature will be obtained and a corresponding amount of heat is saved.

By lengthening the kiln the time of reaction for the raw material to turn into cement clinker is increased which results in improved quality. The use of the inclined grate cooler will provide quick cooling or "air-quenching" of the clinker which also is considered an advantage from the standpoint of quality of the cement.

The site of No. 1 kiln was chosen for the erection of the new extended kiln, utilizing the existing stack. Each of the old kilns was supported on four tires spaced at approximately 52 ft. centers. By erecting three new kiln piers it was possible to support

the extended kiln on seven tires without changing their location with respect to the shell.

Great difficulties were encountered with the sub-foundations for the new kiln piers. It was found that for Pier 1, for instance, solid rock bottom was about 43 ft. below ground level which was about 20 ft. deeper than for the present kiln piers. This necessitated piling supports for all three new kiln piers.

The major job was moving the kilns with the firebrick lining in place and placing them in line on the selected site. Each of the two kilns with firebrick lining weighed about 900,000 lbs. After the three new cement kiln piers were built, wooden trestles, which were supported on the floor, were placed at intervals throughout the length of the kiln building. Two heavy H-beam stringers were run on top of the wooden trestles parallel to the kiln axis. The No. 1 kiln was supported on eight wooden cradles and heavy steel skids rolling on extra heavy pipe rollers in turn supported on the H-beam stringers. Kiln No. 1 was then moved down hill on the pipe rollers a distance of 156 ft. to its final position. The section of the No. 2 kiln to be used was then rolled on its tires on the piers to line up with the No. 1 kiln and the two sections were then riveted together.

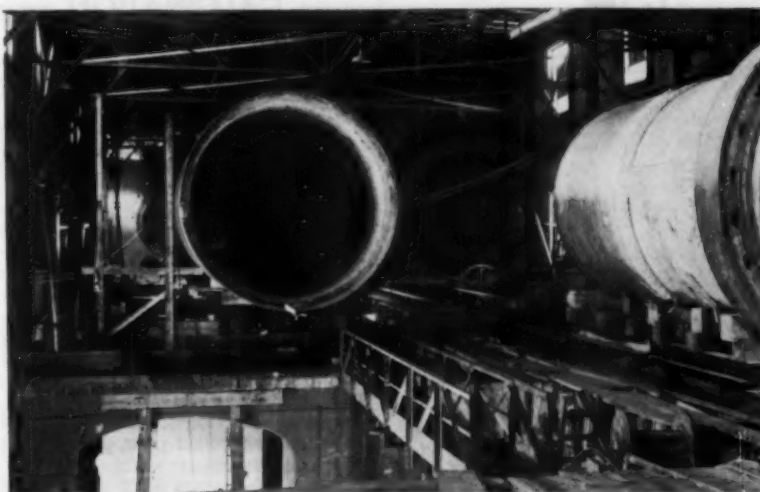
## Use Two Motors in Parallel to Drive Kiln

Each of the old kilns was driven by a 75-hp. slip ring motor. From readings of power input it was determined that the new kiln would not require more than 100-hp., but as it was impossible to obtain early delivery on the type of motor desired, it was decided to use the two 75-hp. motors in parallel to drive the kiln. The girth gears were left in their original position on the kiln shells, placing the drivers on the third and sixth piers.

To insure equal load distribution on the motors, they were hooked up with separate controls exactly as when operating normally except that the controllers were tied together mechanically, to be operated by a common handwheel from the front of the control board. The secondary circuits of the motors were balanced electrically to obtain equal drop in the external secondary circuits and extra resistance placed in each circuit to increase the slip. This added resistance will not affect the speed of the kiln as the motors are under-loaded. A test run has shown that the motors divide the load evenly at starting and at all speeds.

## Building Changes

The extension of the kiln necessitated some major changes in the buildings. The section of the building over the burning floor and the coal mill were of reinforced con-



View looking toward feed end; No. 1 kiln, on the right, is in position; No. 2 kiln is being moved



Two kilns being aligned for assembly into one kiln



Looking toward burner floor. Two kilns being aligned before putting on the connecting butt strap





Coal tower toppling over when shoring is blasted away

crete. Part of the east wall of the building over the burning floor had to be removed and also several columns supporting the roof. A steel frame therefore had to be erected to carry the roof load. The north wall of the coal mill was in line with the center line of the kiln, making it necessary either to move the building or to tear it down and replace it with a new one. The latter course was decided upon as the moving would have been too costly and the building too narrow. After the coal mill was torn down and removed a new building 25- x 130-ft. was erected abutting the old kiln building.

Elimination of the coal mill building presented some difficulties. It consisted of a coal dryer section 23 ft. wide by 55 ft. long by 37 ft. high, and a coal bunker tower 23 ft. by 20 ft. by 65 ft. high. The entire structure was of reinforced concrete, with the walls of the dryer building 6 in. thick, the wall of the tower 10 and 12 in. thick, reinforced with 24- x 24-in. pilasters and interior beams. The dryer building was first removed by demolishing the walls with a demolition ball, and letting the roof fall of its own weight. The tower

was then tipped over toward the south, where it was out of the way and could be broken up later.

To tip this structure was an interesting problem. It was figured that by dropping one side 5 ft. it would become unbalanced and roll over. The walls were removed between the pilasters from the ground level up 8 ft. and hard pine 12- x 12-in. timbers placed in the south wall to support the building while the pilasters on the south were removed. When this was done the building stood on eight timbers on the south and on three pilasters on the north. The timbers were then dynamited, allowing that side to drop 8 ft., and the building rolled over, landing on the desired spot.

## Combine Filter Discharge

No changes have been made in the raw feed to the kiln except to install a belt conveyor to combine the discharge of both filters into a single feeder. Each filter had a degree of reserve capacity for one kiln but neither had enough to feed the new kiln. It was therefore necessary to leave the Ferris wheel feeders and filters intact as originally installed and to synchronize the Ferris wheels and arrange to have them operate from a common source on the new kiln drive.

The capacity of the two kilns as originally installed was 100,000 bbls. of clinker per month. It is anticipated that the new kiln will produce 75,000 bbls. per month with a reduction in coal consumption of about 25 lbs. per barrel.

F. L. Smidth & Co. of New York was retained as consultant and A. C. Stanley Co. of Portland, Maine, was the contractor. The plant is expected to resume operation early in 1945. Lawrence Portland Cement Co., New York, N. Y., also operates another plant at Northampton, Penn.



Coal tower on its side out of the way. Relatively small damage to building is a striking testimonial to the strength of reinforced concrete

## Ohio's Post-War Agstone Production

OHIO STATE UNIVERSITY, Department of Agronomy, sent out a questionnaire to producers of agricultural liming materials in November, 1944, which resulted in some interesting information concerning plans of processors representing 69.3 percent of the State's production. The summary was prepared by R. D. Lewis and P. P. Preston. The questions and the summary of answers follow:

(1) In your judgment, will demand for agricultural liming materials increase or decrease in the immediate postwar period? Increase is expected by 64 percent; decrease by 28 percent, with an average estimate of 16 percent increase.

(2) What are the major factors that will lead to this increase or decrease in demand? Replies stated: continuance of government subsidies (A.A.A. or other), 40 percent; availability of equipment for mechanical distribution, 28 percent; farmers general economic status, 28 percent; farmers appreciation of the product's value, 28 percent; further educational emphasis, 20 percent; and return of labor to farms, 16 percent.

(3-a) Do you plan to increase the output of your plant in the postwar period? Of those replying, 64 percent expected to do so; 32 percent did not expect to do so; and 4 percent were uncertain. In the last two categories over one-third indicated an expected increase in postwar tonnage. An average increase of 50 percent in plant output was estimated by those anticipating an increase.

(3-b) Do you expect to increase sales efforts in the postwar period? Replies indicated 84 percent expected to do so; 16 percent did not.

(3-c) By what methods will such increased sales effort be made? Replies stated: improving service and quality of product, 60 percent; increase in number of salesmen and dealers, 32 percent; increase in use of advertising, 28 percent; direct educational effort with users, 24 percent.

(3-d) Do you plan to establish stockpiles at points other than at your plant in the postwar period? Of those replying, 4 percent expected to do so; 92 percent did not expect to do so, and 4 percent were uncertain.

(3-e) Do you expect to increase deliveries by truck, either directly or through your dealers? Ninety-six percent of those replying expected to do so; 4 percent of those replying did not expect to do so.

(3-f) Will you or your dealers be equipped to spread a greater tonnage of liming materials than in 1944? About 84 percent of those replying were in the affirmative and 16 per-

(Continued on page 123)



# Sand Recovery

## Shipping Sand in Two Sizes

ONE of the subjects arousing most interest among operating men in the sand and gravel industry at this time is the possibility, or maybe probability, of being required to make and ship sand in two separate size divisions. The reason for this is the necessity for eliminating the excess middle sizes, or "belly" sizes, if one wants a good concrete sand. Several methods of processing concrete sand to get rid of these excess sizes already have been described in this series of articles.

An advantage to the producer in shipping his sand in two size divisions would be that the burden of blending the two sizes would be on the user, at the site of the job, instead of the producer's problem at the plant. A disadvantage to the producer would be that he would have to make his split between sizes much more accurately than he would if he were producing a completely blended plant product. The user will not want any appreciable over-size in his fine material or any under-size in his coarser size, for his blended product is calculated on an accurate split. Probably a 5 percent tolerance either way would be the limit.

By NATHAN C. ROCKWOOD

If the reader will refer back to the article on p. 57 of the February issue, he will find that a certain Connecticut sand was corrected so as to almost pass the usual federal government specification by using 60 percent of the washed bank sand, and adding the plus 16-mesh scalped from the other 40 percent of the bank sand. This gave the sand, with 70 percent screening efficiency, shown in Fig. 9, on p. 59 of the February issue and reproduced herewith.

Suppose now, in order to insure getting rid of the bulge or belly in the 16- to 50-mesh sizes, the user of this sand had demanded that it be separated on the No. 16 screen and shipped in two sizes:  $\frac{3}{8}$ -in. to No. 16 and No. 16 to minus No. 100. In this case instead of building up the sand by "sweetening" with plus 16-mesh, the specification would probably require shipments which in effect would use all the plus 16-mesh and approximately half the minus 16-mesh in the bank sand; or one part coarse to 4 parts fine.

Our size analysis using these proportions would then be as follows:

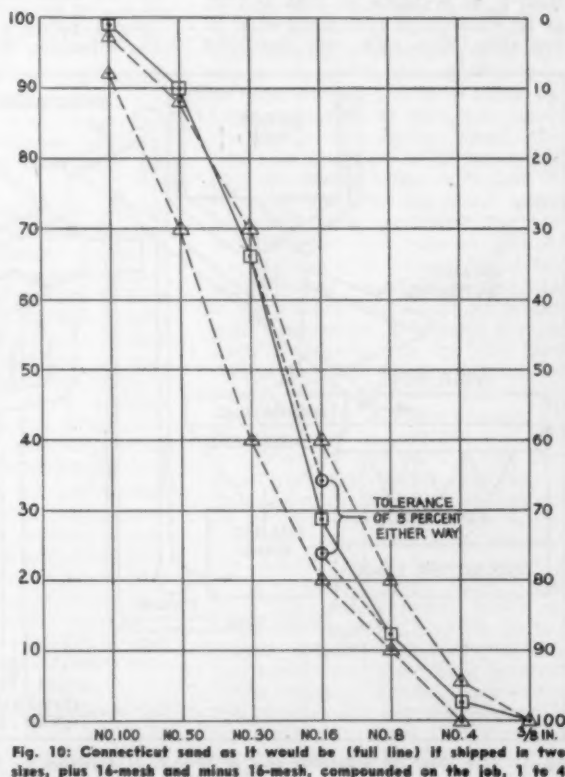
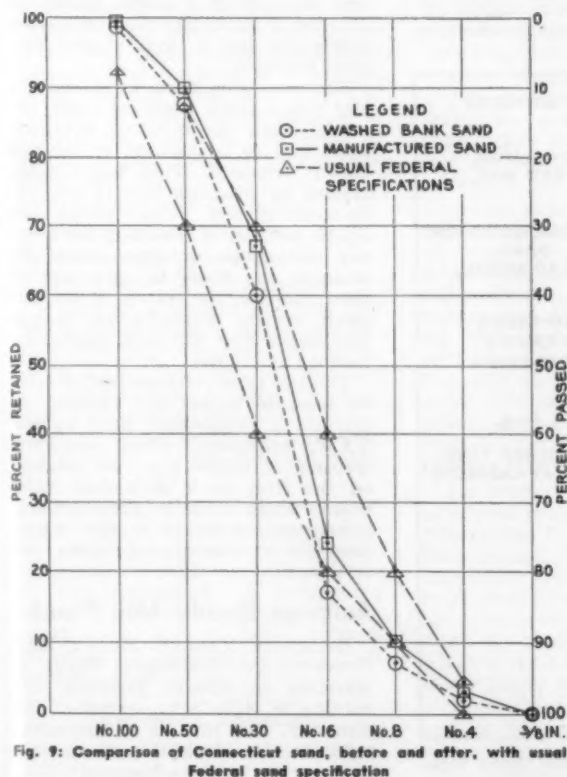
All the plus 16-mesh	Percent
Plus 4-mesh.....	1.5 parts.... 2.6
4- to 8-mesh.....	5.5 parts.... 9.4
8- to 16-mesh.....	10.0 parts.... 17.1
50 percent of minus 16-mesh	
16- to 30-mesh.....	21.5 parts.... 36.8
30- to 50-mesh.....	14.0 parts.... 24.1
50- to 100-mesh.....	5.5 parts.... 9.4
Minus 100-mesh.....	0.5 parts.... 0.6

Total ..... 58.5 parts.... 100.0

Arranged in the customary way this analysis is:

Percent Retained	Percent Passing
$\frac{3}{8}$ -in. ....	0.0..... 100.0
No. 4 ....	2.6..... 97.4
No. 8 ....	12.0..... 88.0
No. 16 ....	29.1..... 70.9
No. 30 ....	65.9..... 34.1
No. 50 ....	90.0..... 10.0
No. 100 ....	99.4..... 0.6

The fineness modulus of this sand, if properly blended on the job, would be 2.99 as against 2.91 for the sand as prepared by the method described in the February article. (The usual specification puts a top limit of 3.0 on the fineness modulus.) It is more on the coarse side, but is a



## SAND RECOVERY

good concrete sand except that it is lacking in the minus 50-mesh sizes.

The objection to shipping sand in two sizes in this case, if the user's specifications had the proportions given here, would be that the producer can use but 58.5 percent of his bank sand against 71.1 percent if he blended his sand at the plant as in the first instance.

Probably the user would insist on recovering the minus 50-mesh and some of the minus 100-mesh sizes from the rejected 50 percent of minus 16-mesh sizes. Otherwise the sand would not meet the federal government specification.

If the producer put in equipment to recover the 6.0 parts of minus 50-mesh in the 50 percent of minus 16-mesh previously rejected, the product would be more satisfactory and the producer would recover 64.5 percent of his bank sand instead of 58.5 percent. On the other hand, he would have to do a better job of splitting his product on the 16-mesh than the 70 percent efficiency in screening in the original operation.

### Guntersville Dam Job

FRED D. COPPOCK, president of the American Aggregates Corp., Greenville, Ohio, has referred a number of times in discussions at conventions of the National Sand and Gravel Association to his plant for making aggregates for the Guntersville dam job, Tennessee Valley Authority, in Alabama, in 1936 and 37, as an example of furnishing sand in two sizes. This plant was described

in detail by the late Frank M. Welch in *Rock Products*, June, 1937, pp. 54-59. It seems to be the only large job in which a plant fulfilling specifications requiring two sizes of natural sand has gone on record, although we have heard of instances where sand to such specifications was desired by the purchaser.

The American Aggregates Corp.'s Guntersville dam plant was designed to make this split in sand sizes; few existing plants are designed for this purpose. In this case specifications required a split on the No. 30; the sizes shipped were No. 4 to No. 30 and No. 30 to No. 100; and these were used in proportions specified by the T.V.A. engineers. The excess fines were wasted as fast as made, since the plant was a floating one, and the unwanted material could be readily dumped back into the river.

This was a large operation designed to handle 250 tons per hour, and we will not go into details except to describe the methods of making the sand split at 30-mesh. These methods could be applied to any size of operation. The chief point is that neither hydraulic separation or screening by itself would do a satisfactory job, so a combination of the two was devised, illustrated in the flowsheet, Fig. 11.

The sand and gravel was received from a pump dredge in a surge box at the top of the plant. Surrounding the top edges of this surge box was a

wire-mesh screen, through which surplus water and fine sand overflowed to a collecting trough or gutter, and went directly to Wood\* hydraulic classifiers. These classifiers were set to make a separation at 30-mesh. The classifiers also were fed with the sand which passed the 3/4-in. bottom decks of the gravel screens.

The spigot discharge, or settled coarse sand from the classifiers went to a settling tank below, and from this tank the sand was pumped to Tyler "400" vibrating screens. This is the electrically (magnetic) vibrated type, with vibrators at the four corners of the screen, and recommended by its manufacturer for screening damp and difficult materials. Water sprays here aided in washing off and screening out of any minus 30-mesh sand that was carried down with the plus 30-mesh in the hydraulic classifiers. The Tyler screens were equipped with 26-mesh wire cloth.

The overflow product of the hydraulic classifiers, joined with the fines removed by the Tyler screens, went to a large sand settling tank, of what Stanton Walker calls the "possum belly" type. It is broad, long and shallow with cone collectors in the bottom. By means of baffles and deflector vanes, it was possible to collect fine sand of various sizes in the separate cones. These discharged to compartments which fed a collector tank below. The blended sand was removed by a pump. Excess of any one or more sizes could be wasted overboard and a well graded fine sand collected.

However, this sand would naturally retain some over-size (over 30-mesh) from the classifier overflow, so it had to be scalped or cleaned before shipment. This was accomplished by pumping it to a gravity, 20-mesh screen, which served the double purpose of removing the over-size and sticks, or other trash. No attempt was made to save any of this over-size, the rejects of the 20-mesh gravity screen being sluiced overboard. The throughs made the finished fine sand.

The two sand products were loaded on separate barges and blended on the job in proportions fixed by the T.V.A. engineers. What was not shipped, of either size, was stocked on the river bank or wasted overboard, which could be done without interference with the dredge operation, for it was approximately 250 ft. distant.

### Enlarge Ready Mix Plant

HARLINGEN VALLEY READY-MIX CONCRETE CO., Harlingen, Texas, is planning to enlarge facilities, according to Hill Cocke, owner of the company. The plan is to manufacture concrete block as soon as wartime restrictions are removed.

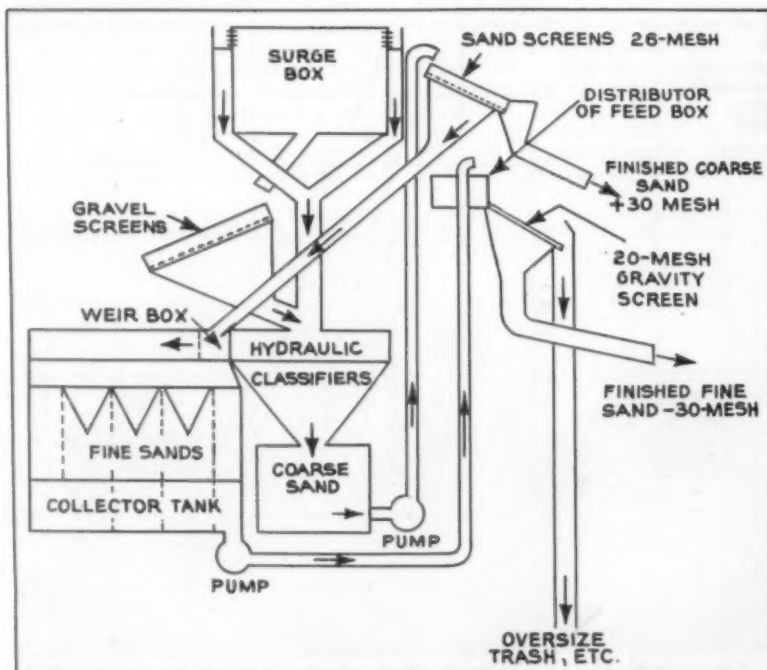


Fig. 11: Flow sheet for separating sand at 30-mesh as developed by Greenville Gravel Corp., Guntersville, Ala.

# Phosphate Products

## Production Problems

By OTTO H. WUSTRACK

### Article 5: Sampling and analysis

**S**HIPPING COMMITMENTS of a phosphate producer are varied and he must be able, upon very short notice, to make several different grades of both lump and sands, as well as ground rock. This is done by blending the washed undried rock from the different sections of the storage area as it is fed to the dryer feed tank. When the grades at hand do not make the grade sought, the only choice left is that of washing selected muck. Likewise the grade of ground rock is predetermined by blending dried rock taken from those sections of the storage shed which previous analysis has shown to be approximately the quality needed. This flexibility of production requires the regular use of sampling at the washer feed and discharge, at the dryer discharge, at the cyclone collector, and finally in the cars at the shipping platform. Auxiliary sampling for the purpose of checking on performance throughout the entire plant, is a periodic necessity.

Most of the sampling whether mechanical or manual involves large quantities of a heterogeneous mixture of lump sand and sometimes clay. Both speed in obtaining final answers, and accuracy of those results, depends upon how well the identity of the original sample is kept as it is quickly cut down to analytical size. This proceeds in four steps, viz.,

- (1) Mixing and quartering
- (2) Drying and crushing
- (3) Mixing and splitting
- (4) Grinding and quartering

A sample originally weighing 200 lbs. is taken down to pound size before chemical analyses are made, which makes it self-evident that the four steps must be executed by a well paid conscientious worker and in accordance with a definite and unvarying procedure, if the analytical work is to be of value.

Since the method of processing varies with the type of material to be sampled, examples are hereby chosen which cover the main aspects of the production of phosphate; namely raw muck, washed rock, dried rock, ground rock, tailings (pond sands), and reject slurry from washer.

#### Raw Muck Sampling

Muck in the "as mined" condition delivered to the plant via truck or

tram car is a conglomeration of clay seams, muck, plate rock often 3 to 4 in. across, and pieces of limestone. A large shovelful is caught from each car or truck as it dumps, care being taken that the sampling is done at the same relative point under each car, regardless of what "judgment" the eye may be attempting to exercise. One hundred cars will yield a sample of from 800 lbs. to 1000 lbs., the accumulations for the day being kept in a covered steel drum. At the end of the day or shift the contents are dumped onto a steel platform and shovel-mixed by two men in a manner commonly applied in mixing concrete, and lumps six inches or over broken with a sledge. The pile is shoveled through from end to end three times, then coned and quartered, with opposite quarters going to reject. The remaining quarters are mixed as before and coned and quartered again, with the remaining two quarters ready for drying.

The drying of massive samples like that of muck is best done on a large cast iron plate heated by a coal fire, the balled up masses being broken up with a rake which is also used for constant stirring.

When sufficiently dry the sample is put through a roll crusher, followed by mixing and quartering twice, before the remaining two quarters are sent to the laboratory jaw crusher.

At this point it might be well to point out that for the determination of moisture a separate sample is taken after the second quartering of the original sample and dried in a special oven without further crushing. This oven is heated by electrical strip heaters under thermostatic control, with shallow aluminum trays to carry the samples. Muck requires about 12 hours for this determination, but for other types of samples the time required is considerably less.

The product from the jaw crusher is reduced twice through the common riffle splitter and the retained sample then ground in a Braun pulverizer. The pulverized sample is rolled on a large sheet of heavy paper and coned and quartered repeatedly to bring it down to a mass of a couple of pounds which is then put into a labeled container ready for the analyst.

Washed rock discharging from the end of the washer lends itself to mechanical sampling because it is free flowing, discharging from a

spout or chute in a constant, if not always a uniform, stream. Two different samplers will be described.

#### Washed Rock Sampling

A common cutter is that of a cup or little spout on a reciprocating arm which operates at set intervals of time. The mechanism consists of a steam or air cylinder, which is connected at each end to air (or steam) line through a four-way plug cock. The cock is operated by a pair of spring loaded solenoids which in turn are timed by an electric timer through a relay. The air is thus alternately supplied to opposite ends of the cylinder from a common line and exhausted to a common line. Since the complete cycle requires a very short air period followed by a long exhaust period, followed again by a repetition of the same for the opposite end of the cylinder, the adjustments on the timer are rather delicate and therefore trouble with the contacts is apt to occur.

Another sampler which is entirely mechanical, that is without timing circuit, is as follows: a low speed motor rotates a vertical shaft at about one r.p.m. through a high ratio speed reducer. To this shaft is keyed an arm equipped with a roller follower engaging the plate cam, which rotates on an adjacent shaft. This cam has attached to it the sample cup, the design being such that the cam and hence the cup is only moved one-third of a revolution for each revolution of the follower. In this way the cup cuts through the stream at the rate of one r.p.m., resting clear of the stream for the second revolution, cleaned by a scraper for the next revolution, idle for the third revolution, and finally cutting the stream again on the fourth revolution. A sample of approximately 300 lbs. can thus be obtained per shift producing 300 tons of rock. The large speed reduction makes first cost of this equipment high, but this is offset by the ruggedness which can be built into the moving parts. Although the sample take is not excessive, it is nevertheless much larger than that taken by the quick acting reciprocating sampler, and therefore a greater risk of error is encountered in the additional quartering required.

The mixing, coning, quartering, drying, etc., are carried through in the same manner as that described above under muck sampling.

(Continued on page 138)



# Ready Mix

## Portable Batching Plant Saves Haulage Expense

Ready Mixed Concrete Corp., Indianapolis, Indiana, conserves gasoline, tires, and truck parts by using portable batching plant for jobs at considerable distance from main plant

By H. E. SWANSON

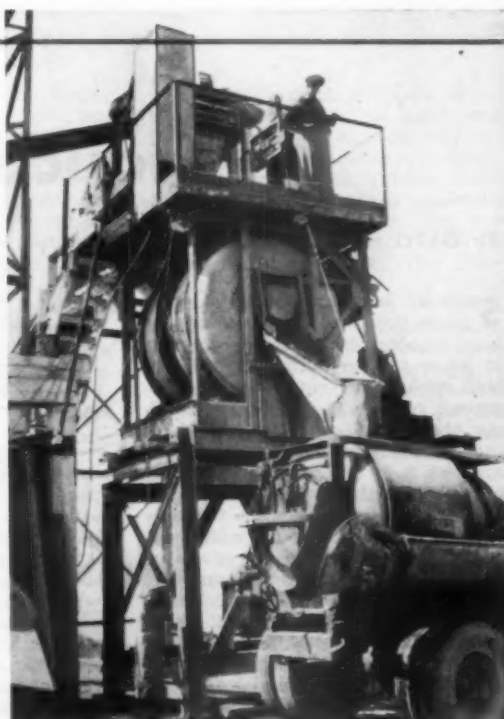
**T**O CONSERVE gasoline, tires, truck parts, labor, and meet the transportation problem which has become very acute due to a shortage of these items, the Ready Mixed Concrete Corp., Indianapolis, Ind., has assembled a portable, central mixing plant which permits continuance of deliveries of concrete far beyond the city limits to jobs where more than 300 cu. yds. of concrete is involved. The plant may be transported from one job to another by truck or railroad.

When it became apparent that jobs located some distance from the city could not be accepted due to Government restrictions on length of haul, this company assembled its portable plant early in 1944 from bins, conveyors and batching equipment on hand. It can be taken down and then assembled at the new job-site in three days, and has a capacity of 40 cu. yd. per hour with a four-man crew and 80 cu. yd. per hour with a five-man crew.

Aggregates are weighed out in individual batches before delivery to a belt conveyor which feeds an auxiliary hopper above the mixer. This method of operation is to insure constant production with no delay since there are two batches ready for the mixer at all times. While one batch is in the mixer, another is in the auxiliary hopper, and the third is ready for delivery to the belt conveyor. The operator of the mixer controls the belt conveyor and when he is ready for the delivery of a batch to the auxiliary hopper, he starts the conveyor which indicates to the operator at the delivery end of the conveyor that the batch is ready to be sent up to the hopper.

Two Blaw-Knox bins, equipped with batchers and scales, are used

Premixed concrete is chuted into mixer trucks operated as agitators



for the aggregates. The coarse aggregate bin is divided into two compartments, each having a capacity of 20 tons. This allows the use of two sizes of coarse aggregate. The fine aggregate bin with a single compartment has a capacity of 60 tons. Two bins were used rather than a three-compartment bin because the Indiana Highway Department requires a separate bin for coarse aggregates and a separate bin for fine aggregates. To place the second bin over the belt toward the plant would place the top of the bin at such a high elevation that it would be difficult to load it with an ordinary crane. There also would be no room for stockpile storage. The coarse aggregates bin therefore was placed about 75 ft. back of the sand bin which is supported over the end of the belt conveyor.

Coarse aggregate is weighed out at the bin and released into a specially designed 2-cu. yd. batch hopper mounted on a truck chassis for delivery to the belt conveyor. The batch hopper on the truck is equipped so that it can be discharged directly onto the belt with very little depression of the tail pulley on the belt. The operator first discharges the sand batcher onto the belt and then opens the gate on the coarse aggregate hopper. While the coarse aggregate is discharging, he weighs up the next batch of sand. There is very little loss of time in these operations, and only one man does the batching and operates the truck. The expense of the truck operation is very small as it only runs a few miles

a day, and the consumption of gas and oil is low.

Aggregates are moved up to the top of the mixing plant on the 30-in. belt conveyor, 100-ft. centers, which is equipped with Stephens-Adamson idlers and is driven by a 15-hp. G. E. motor. The conveyor discharges into a 2-cu. yd. auxiliary hopper from which aggregates are released into a 2-cu. yd. Rex concrete mixer driven by a 40-hp. G. E. motor.

A Link-Belt bulk cement arrangement is used in this plant. A 10-in. screw conveyor, 16-ft. centers, delivers cement from railroad cars to a bucket elevator, 33-ft. high, which charges a 70-bbl. capacity steel bin. A 10-in. inclined screw conveyor, 14-ft. centers, reclaims cement from this bin for delivery to an auxiliary bin located above the mixer. Cement is drawn from this bin into a weigh batcher equipped with Kinney cement scales and then dumped to the mixer. Power for the cement conveyor system is provided by two 7½-hp. G. E. motors, one for the lower screw conveyor and elevator, and the other for the upper screw conveyor.

Water from the city supply is used whenever possible, but in the event that such delivery is not possible, a Worthington pump is employed to fill a 120-gal. water tank equipped with Blaw-Knox scales.

After mixing, the concrete is chuted into the drums of mixer trucks, used as agitators, for transportation to the job. The end of the chute is designed with a spout that fits closely around the drum opening to prevent spillage. Length of haul determines the num-

ber of mixer trucks on the job; the company having a fleet of 31 from which to draw. The fleet is composed of 2-, 4-, 5- and 6-cu. yd. Rex and Jaeger mixer units.

## Prefer Central Mixing

A central mixing arrangement was used in the portable plant in preference to a transit mix setup as the company's experience with transit mixed concrete has not been very satisfactory both from the standpoint of wear and tear on equipment and the control of the concrete, states vice-president and general manager C. Gray. The strain on the motor which rotates the drums on a rotor or transit mixer is many times more when the ingredients are placed in the drum without preliminary mixing, in his opinion. This company's experience also indicates that the transit mixer does not do as good a job of mixing as a stationary mixer.

Another objection to transit mixing in Mr. Gray's opinion is that it is very difficult to correct a batch which arrives at the job too dry even though an auxiliary tank of water may be carried. This is due, he says, to the fact that the ordinary truck driver is unable to determine how much additional water is required to bring the batch to the proper slump. In case the batch is too wet there is nothing he can do about it as there is no means of drying it up.

In the case of the central plant mix where a 4-cu. yd. truck load is involved and a 2-cu. yd. plant mixer is used, it has been found easy to correct and control the slump. In case the first 2-cu. yd. batch placed in the agitator has too high a slump, the operator, if an experienced and well-trained man, can reduce the water in the next 2-cu. yd. batch so that the

resulting mixture of the two batches will carry slump within the slump requirements. If the first batch is too dry, water, of course, is added to the second batch.

## Cement Bin of Special Design

Another interesting feature about this portable plant is the 70-bbl. steel cement storage bin. This bin was designed by the company to insure a uniform flow of bulk cement to the screw conveyor which feeds the auxiliary hopper over the mixer. It was designed so that the corners of the pyramidal bottom carry a 60-deg. slope with the horizontal. No air or mechanical agitation is required to keep the cement flowing from the cement bin to the screw conveyor. In commenting on this bin design, Mr. Gray has pointed out that most of the bins now in use carry a much flatter slope down which the cement may not flow except by the use of air, pounding the bin with sledge hammer or with some kind of mechanical agitation. In such bins, even when the cement is caused to flow by any of the above devices, cement will hang in the corners and finally set up as a warehouse set or from condensation in the bins. Then periodically this cement which is set up will break loose and clog the screw, and if it goes through the screw, it is sure to clog the rotary on the batcher giving considerable trouble.

Typical of the types of jobs served by this portable plant is the recent project involving patching and widening U. S. 34 from Indianapolis west. The portable plant provided 20,000 cu. yd. of concrete for the Indiana Highway Department, using two different plant setups.

Mrs. Ora H. Tutwiler, president of

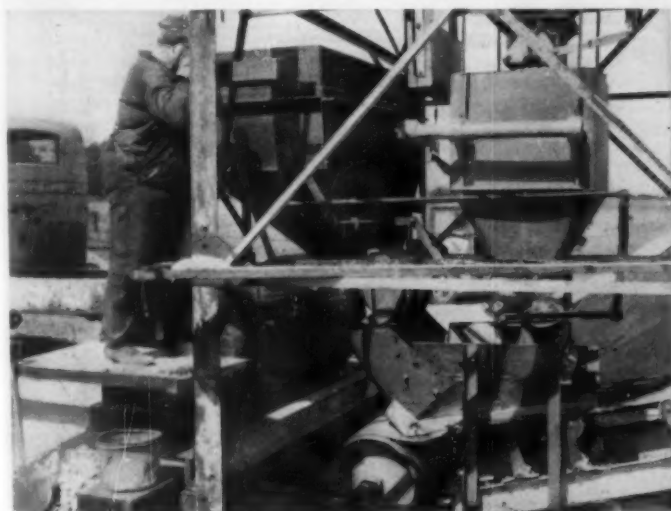


Bulk cement elevator and screw conveyor to the right convey cement to enclosed bin, above. Another screw conveyor takes cement to scales above aggregate hopper feeding concrete mixer

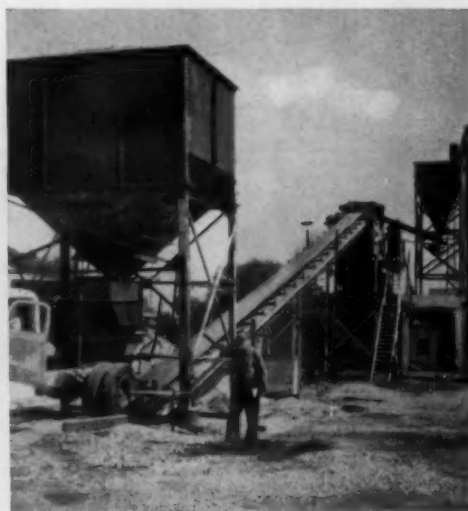
the Ready Mixed Concrete Corporation and Mr. C. Gray, vice-president are co-owners. This company has four permanent ready mixed concrete plants in Indianapolis in addition to the portable plant.

## Chile Buys Lime Kilns

GILDEMEISTER & Co., Santiago, Chile, has placed an order for two York-Kuntz vertical lime kilns and a complete Kuntz gravity system of lime hydration with Lime & Hydrate Plants Co., York, Penn. There are a number of kilns of this type in South America, and one in Lima, Peru, uses bagasse as a fuel which is said to be the only kiln of this type fired with this form of fuel.



Left: Batch loader feeding belt conveyor with gravel. Fine aggregate is fed to the belt from bin, above. Right: Belt conveyor inclining up from batch loader to mixer; bulk cement plant may be seen to the right



# Dredging



Diesel-powered dredge of the Flint Sand and Gravel Co., subsidiary of Jahncke Service, Inc.

Flint Sand and Gravel Co., New Orleans, La., operates three Diesel engines on dredge; a large 8-cycl., 315-hp., unit for pumping and screening, and two smaller units for auxiliary power purposes

## Big Savings with All-Diesel Dredge

**A** DIESEL-POWERED DREDGE has made a record of economical, efficient service at the Bluff Creek location of the Flint Sand and Gravel Company, subsidiary of the Jahncke Service, Inc., New Orleans, La. The company uses purchased power for its other plants and finds that Diesel operations at Bluff Creek mean a considerable production cost saving over its other electric powered operations.

The all-steel hull was built by the Lester F. Alexander Shipyard on the Industrial Canal in New Orleans and was shipped to Bluff Creek on flat cars. The three pontoons were then bolted together and the equipment installed. The main power unit is a Type FP, four-cycle, mechanical-in-

By W. H. GOTTLIEB

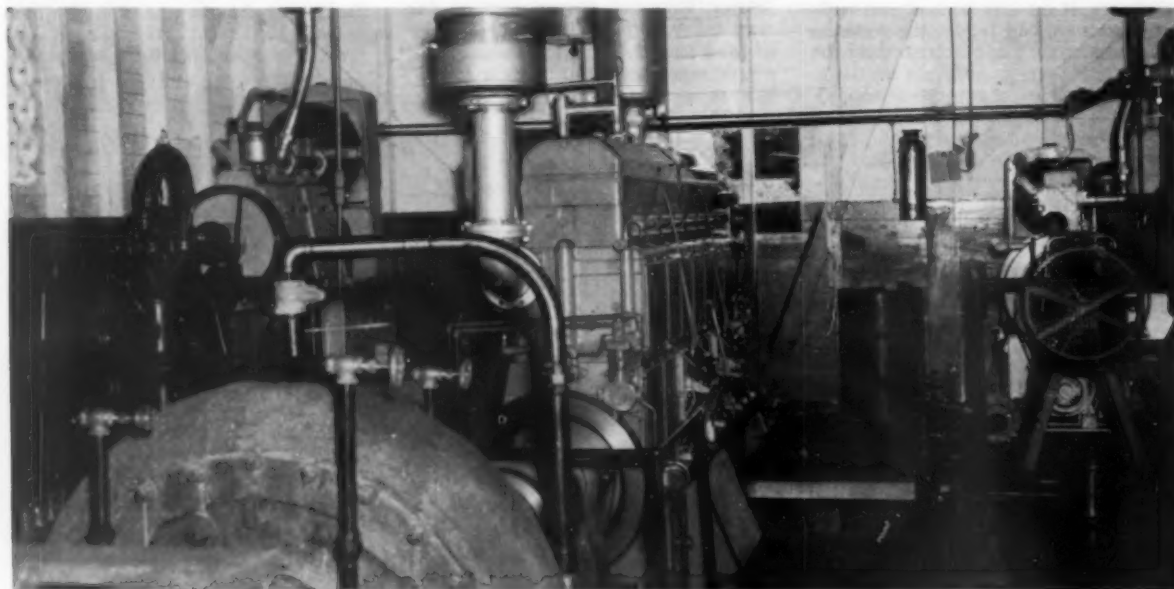
jection, Cooper-Bessemer Diesel. This engine which can be run at various speeds and is rated at 230-hp. at 350 r.p.m. and 315-hp. at 519 r.p.m., drives an Amsco centrifugal counter-flow gravel pump through a flexible coupling. In pumping relay, the engine is operated at 300 r.p.m., but in pumping up to the screens the Diesel is run up to 500 r.p.m. The dredge was designed to handle from 12 to 15 cars of gravel a day, pumping through a 1200-ft. line. When this article was written, the pipeline was 470 ft. and production had run as high as three cars of gravel and one car of sand in a single hour. The

dredge averages 28 cars of gravel and sand per day.

### Oil Stored in Dredge Pontoons

Under normal conditions, operations in Louisiana continue throughout the year and equipment has been chosen with a view to long, continuous service. The Diesel and all accessories are arranged compactly in an engine room that is a model of cleanliness and order. Both in design and in operating procedure, every effort is made to protect the equipment and to keep it in efficient running order at all times. This company feels that lost hours are more expensive than good equipment and careful maintenance.

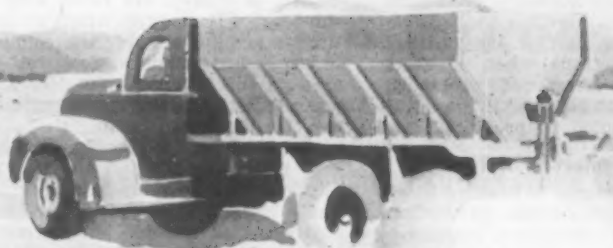
(Continued on page 110)



In the center may be seen the 4-cycle, mechanical injection Diesel, rated at 315-hp., at 519 r.p.m., driving a centrifugal counter-flow dredge pump. On each side are two Diesel auxiliary engines



# AGRICULTURAL LIMESTONE



By BROR NORDBERG

**Majority of agstone producers expect farmers to continue application of liming materials in spite of a reduction in A.A.A. funds; expect big 1945 production**

**T**HE SLASH in the Agricultural Adjustment Agency's funds for liming materials in 1945 has raised considerable speculation as to the probable effect on the industry, particularly if further reductions in subsidy payments should follow. Inasmuch as many producers are disturbed, we have solicited opinions from leading producers throughout the industry and are gratefully indebted to many who contributed their suggestions as to how to hold the farmers' business.

Not more than 25 percent of those who replied to our letter believe that a real serious reduction in volume will follow the removal of government financial support to the farmers, but those that do fear for the future of their business fall into a definite class. They constitute producers who are engaged entirely, or nearly so, in the production of agricultural limestone. Admittedly, very few in that classification replied to our letter. This group also includes some of the bigger producers of commercial aggregates who have been selling agricultural limestone to relatively small farmers of the poorer class and in areas where the application of liming materials is still an innovation. They believe their customers will not be able to continue buying agstone without government financial support and, in some of the States, that insufficient agstone has yet been applied to justify the farmer's paying out his own money for the product.

Others believe that the farmer's willingness to contribute in part for agstone, 20 percent in 1944, is indication that he believes in the value of liming his soil and will continue to do so. They point to the fact

that 1944 volume likely exceeded that for 1943. Producers serving areas with substantial farms do not seem disturbed and those with a relatively low ratio of agricultural limestone business, a by-product, anticipate that the problem of trying to meet demand will continue whether there is government money available to the farmer or not. A few expressed their opinions that no serious loss of business will occur if farm prices be maintained at a high level, even if subsidies be discontinued, if the industry will initiate and sustain a selling job to approximate what the AAA is accomplishing.

A few of the companies that replied, believe the volume of business will suffer proportionately to the degree of any reduction of government funds, but those companies either are in poor farming communities or in areas where the benefits of liming the soil have not yet been established, or they have been doing an "over the counter" business without long range selling effort, probably because they have been too busy producing agstone to do anything else.

Even those producers who admitted they do not believe in the principle of subsidies, even if their removal would adversely affect their business, concede that AAA has done a remarkable job in promoting the use of agricultural limestone and acknowledge that a permanently increased volume of agstone will result from the AAA program. The pressure brought by AAA to have farmers take liming materials when available, often in non-planting months, has admittedly been a great benefit to the industry in increasing volume. It is the opinion of most, that if the farmer be given more

choice, which he would have if he paid the full price for his materials, the industry will revert back to having to meet extreme peaks in the Spring and Fall months.

The foregoing is but a summary of returns to our letter. The following selected paragraphs from some of the most informative letters received will more clearly express industry thought on the subject.

## Dealer Organizations

A long-established Pennsylvania producer of limestone products said, in part,

"From the inception of the government program we have tried to anticipate the time when government support would no longer be offered to agriculture. To meet this situation we have at all times handled our government tonnage through our regular dealer organization and we feel that when the government withdraws its support from the A.A.A. program that we will be in a position to carry on through our regular dealer set up.

"There has been a very limited tonnage moved through the dealers' hands, from their own sales, and some manufacturers have moved government tonnage into a dealer's territory through an outside trucker and probably effected a small saving, but losing a good dealer through this method, the effect of which will be felt by the manufacturer when there is no longer a government program to support them.

"Should the government withdraw its support from the A.A.A. program we feel that the demand for agricultural limestone will no doubt be less but are unable to say how serious

this may be but no doubt it will be quite serious for a season or two. This year the farmer has to pay about 20 percent of the cost of his limestone received through the A.A.A., yet from present indications the tonnage handled this year by A.A.A. will exceed that of last year, so it begins to look as if many farmers, who were not users of lime, have become educated to the use and value of liming the soil and are willing to pay to get it.

"There is one thing the government has been able to do that the manufacturers were unable to accomplish, over the years, and that is, the farmer was forced to accept his limestone when it was available. We were permitted to deliver limestone during the 12 months of the year, something which was unheard of previous to the time when the A.A.A. began to operate. We are of the opinion that the sales of bulk limestone will continue to be seasonable as the farmer is in no position to handle and store bulk agricultural limestone. The agstone which we have been furnishing the government during the off season has been sacked. The bulk material which we have furnished has been seasonable and we feel that regardless of what effort may be made the farmer will continue to demand his material during the planting season, especially in the territory where it is delivered direct to field by truck. Price concessions have been made from time to time to induce the farmer to take his agstone out of season but without results."

A medium-sized producer of crushed limestone, riprap and agricultural limestone in Kansas had this to say:

"Reduction of AAA funds will not have very much effect on orders in the coming year. However, in later years, a continued reduction in AAA funds will see a corresponding reduction in sales. We are adding nine trucks with spreader equipment for this year's business. We plan to use newspaper form periodicals and radio advertising to insure maintenance of sales at last year's level."

From Wisconsin, an average size, crushed stone producer with a heavy production of agricultural limestone said,

"Most producers in my territory, as well as myself have been disturbed about the reduction in AAA funds. It is the opinion of most producers that the sale of agricultural limestone will be reduced by one third."

From Kentucky, we received the following comments:

"I have your letter of February 26, and beg to advise that the people in this community were awaiting the result of the reduction in the government subsidy on agricultural limestone with bated breath. However, preliminary investigation reveals

that, with the farmers contributing 20 percent, there still seems to be a very good demand in Kentucky. This company has given consideration to a more intensive promotion with the view to meeting the possible failure on the part of the farmers to apply limestone when it costs money. We have not proceeded farther than to consider it, however, and have adopted no program."

## Big Farmers Will Buy

An Ohio producer of crushed limestone, with considerable production in agricultural limestone, remarked,

"Judging from past experience and on our own individual market, we are not too disturbed about the reduction in AAA funds for 1945. We wish to go on record as giving the AAA program all the credit at our command for what it has done in the past and is still doing for the agricultural limestone industry. We do feel, however, that the greatest contribution has been educational and promotional. The capacity of our production is limited and we would have in the past two years been able to market all the material which we were able to produce without the assistance of AAA from a financial standpoint."

"The counties in which we are interested have AAA boards which very generously recommend the application of agricultural limestone on a private basis and then give credit to the limit of their ability from our invoices which the farmers present to their boards. We, no doubt, will lose a great number of small orders from farmers who are not financially able to make agricultural limestone applications. However, the sum total of these orders will not be an appreciable tonnage in the year's business. This picture may not be at all applicable to most parts of the country. We are located in a very progressive section where most of the farms are large and operated by people of considerable means and ability, making our problem much less difficult."

"The farmers in our locality are very cooperative in taking their limestone deliveries whenever we are able to deliver, which again is in a large measure due to the excellent cooperation of the AAA organization. Again we wish to say that we are very much indebted to the AAA for its educational and promotional programs and we feel that as long as economic conditions are good for the farmer that we will enjoy a record business on agricultural limestone without worrying too much about financial aid of the AAA program."

A Missouri producer, wrote, in part, as follows:

"Practically 100 percent of all limestone sold by us during the past has been sold through trucking companies which are awarded contracts

directly by the U. S. Department of Agriculture on a delivery basis by trucks to farmers and also delivered and spread."

"We, of course, are faced with a shortage of manpower, which at this time is general all over the country in our industry, but we feel that as soon as this emergency is over and when trucks for delivery of limestone can be purchased again, that the agricultural limestone business should very materially increase due to the fact that the government's program under its Soil Conservation Act has obviously advertised and demonstrated the necessity for the use of agricultural limestone in the growing of all legume crops. It is our understanding that this year's program throughout the counties in this section of Missouri is being handled on a different basis than last year; namely, the government, through the U. S. Department of Agriculture, is underwriting the cost of agricultural limestone on the basis of \$1.50 per ton and if the plant price, plus the delivery and spreading costs exceeds \$1.50 per ton, the farmer is required to pay the difference. While this plan puts all farmers on the same basis in so far as the subsidy of the government is concerned, it may prevent farmers from applying as much agstone as they did in the years past due to their inability to pay the excess over \$1.50 per ton where the delivery point is quite distant from the source of supply. Nevertheless, it is our opinion that with the large amount of limestone spread in southeast Missouri during the past four years and with the obvious results obtained, that the program instituted by the government will be continued by most farmers because of their experience and increased production."

Another Kentucky producer would welcome a reduction in demand according to his letter which read, in part,

"We are not familiar with the extent of reductions in A.A.A. funds which will be made available for agricultural limestone payments and have taken no action to offset this possible reduction. However, our experience in the past is that we would almost welcome a reduction in the demand for agricultural limestone as we have been able to fill only about one-half of the business offered, and this has caused a great deal of dissatisfaction on the part of customers."

## Subsidies Not Favored

From Texas, we received the following philosophical comments:

"From a selfish standpoint, any producer of agricultural limestone would be interested in encouraging the continued distribution of his product by the federal government

(Continued on page 114)

# AGSTONE Is Big Business

**Columbia Quarry Co., St. Louis, Mo., operating four plants in Illinois and Missouri, has converted half the entire capacity to agricultural limestone production**

**By BROR NORDBERG**

**M**ANY hundreds of producers are actively engaged in the production of agricultural limestone, but the average contribution of each to the soil building and soil conservation program is a relatively small tonnage. The average tonnage produced by the majority amounts to one, two or three hundreds of tons per day.

In contrast to those types of operations, the Columbia Quarry Co. with offices in St. Louis, Mo., produced and shipped over 5 percent of the national tonnage in 1944. This concern, with three crushed limestone plants on the Illinois side of the Mississippi river and a new one in Missouri, laid the groundwork for an agricultural limestone business in excess of a million tons annually, long before the majority of producers even thought of agricultural limestone.

E. J. KRAUSE, president of the Columbia Quarry Co. and a past president and director of the National Crushed Stone Association, probably was the first producer to publish and distribute educational literature on the subject of liming the soil. He recognized its value back in 1908, when he started to put out informative data and he continues the practice of distributing promotional and educational data today, 37 years later.

In his office recently, we had the privilege to examine the last remaining copy of a little booklet entitled "The Story of Lime" that was distributed by the company in 1918. The title of the booklet is a misnomer, for it emphasizes agricultural limestone, but even today the words lime and limestone are used interchangeably for some unexplainable reason. Back in those days when Mr. Krause was on the road selling limestone, he put a copy of that little book in the hands of every pupil of every country school above the primary grades in southern Illinois to "catch them while they are young," as he expressed it.

The text, written by D. Howard Doane, then former professor of Farm Management, University of Missouri, and State Leader of County Agents in Missouri, U. S. Department of Agriculture, explained in simple story style the very benefits of applying limestone to the soil that appear in current literature. Eight years before that, in 1910, Mr. Krause had a county adviser, a graduate in agriculture from the University of Illinois, writing educational pamphlets for him.

This early beginning, in the application of agricultural limestone to the acid soils of southern Illinois, has given farmers many years to observe the effect in increased crop



E. J. Krause, president of the company, who has guided its destiny for many years

yields and gave the business its start.

Columbia Quarry Co. has progressed far beyond the retail stage of the business. Today, it is a wholesale business. Established dealers scattered over five states handle the sales exclusively and 90 percent of the tonnage is moved by rail from the four producing plants. While shipments are made as far as the delta section in Mississippi and into Kentucky, Tennessee and Missouri, southern and central Illinois farmers take more than half the tonnage.

Service is the essence of the business today. The bigness of the operations and the service the company is in position to render are the important factors in sustaining such a large volume of sales. Potential daily plant capacity is 6500 tons and the



Panorama of Krause No. 1 plant, showing quarry in background as it looks after nearly 40 years' operation. On right is Diesel power plant





Overall view of Valmeyer, Ill., plant with mine in the background and large stockpile of agricultural limestone in foreground

availability of 12,000 t.p.d. is advertised.

Plants are operated at Krause, Valmeyer and Prairie du Rocher, Ill., all south of St. Louis, where high calcium ledges of limestone outcrop near the Mississippi river and a fourth plant, at Elsberry, Mo., is coming into production. Rail service is available on four lines and switching facilities are available to 16 rail-

roads at East St. Louis, Ill. Loading facilities are available to truckers at each plant.

Columbia Quarry Co. owns and maintains permanently established special railroad unloading facilities for dealers at 13 locations in Illinois and shipments are made to these rail points on orders placed by those dealers. They consist of track unloading hoppers, designed and con-

structed to the particular railroad's specifications, with portable belt conveyors for direct loading of spreader trucks from gondola railroad cars. General conveyors and others are in service, powered by electric motor where electricity is available or by gasoline engine, and maintenance men from the Krause plant service the equipment. These facilities are established at locations where a minimum of 150 carloads will be unloaded annually.

## Other Production

While half the tonnage of the four plants combined was agricultural limestone in 1944, Columbia Quarry Co. always has been and is a big producer of commercial aggregates and chemical and metallurgical limestone. The high ratio of agricultural limestone to total production is, of course, higher than it ever had been before the war but production facilities for agricultural limestone have been dove-tailed into the plants for flexibility that will enable continued high production of that product.

The plant at Krause is by far the largest of the four, with a rated total production of 350 t.p.h. It produced 1 1/4 million tons, 559,000 in agstone, in 1944. Most of the company's production of aggregates and rip-rap is from this plant.

At Valmeyer and Prairie du Rocher, exceptionally high purity limestone, well over 99 percent  $\text{CaCO}_3$ , and particularly suited for chemical purposes, is mined underground. Some of the principal products at these locations comprise metallurgical stone, asphalt filler, mine dust, grits of various sizes and other special purpose fine products ground to 200- and 325-mesh finenesses. At Elsberry, Mo., agricultural limestone will be one of the principal products.

Considerable of the tonnage of agricultural limestone is a product of fracture in blasting and crushing, but, to meet today's demands, the

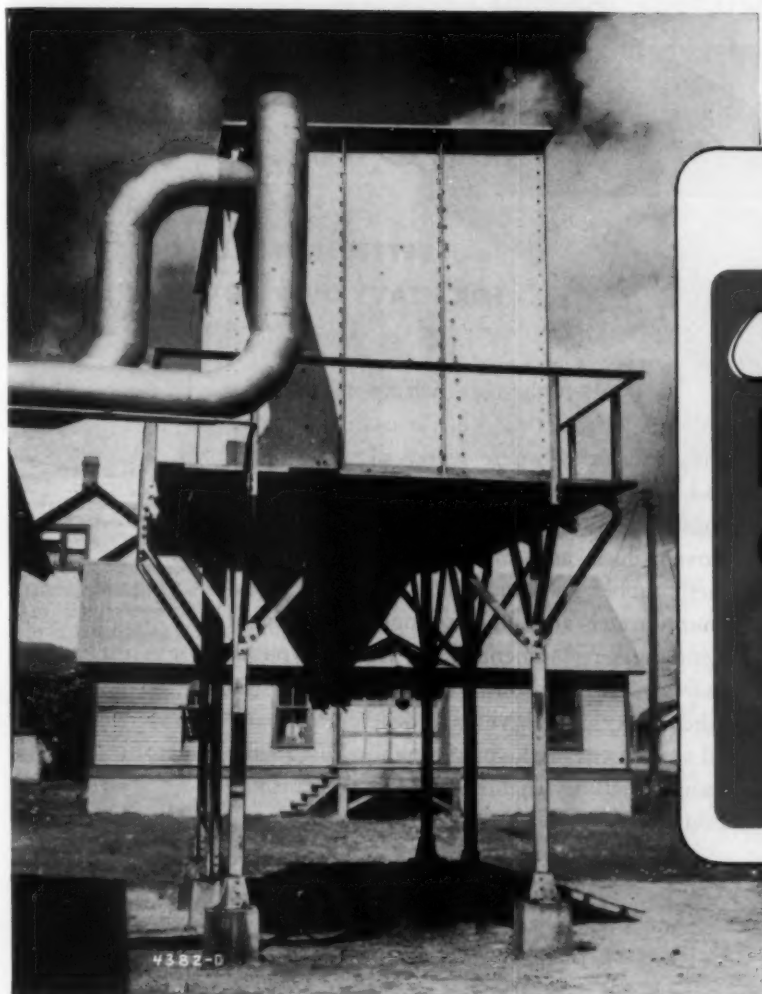
(Continued on page 81)



Surge pile at Valmeyer plant and stacking conveyor filling it. On the right is the agstone pile and stacker from the screening tipple may be seen in the background



One of 13 permanent unloading hoppers and conveyors owned by the company for servicing agricultural limestone dealers



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Showing new track hopper arrangement at Krause plant with 250 hp. gasoline locomotive emerging. Pulverizing plant in background



Agricultural limestone plant at Krause, Ill., may be seen in the foreground; main plant in the background. To the left is the new track hopper and elevator for handling stone from stockpiles into pulverizer bins. On the right is the conveyor to the new 200-ton truck loading bin

company has 13 American Pulverizer Co. pulverizers in service. Three are in operation at Krause, three at Valmeyer, three at Elsberry and four at Prairie du Rocher where the bulk of total tonnage is in fine stone products. The company has standardized on Stephens-Adamson material handling equipment, with few exceptions, in recent installations to increase agstone production.

## Krause Plant

Great flexibility is required at each plant to enable commercial grades of crushed stone to be produced while agstone is produced to the maximum of capacity. Agstone is processed to a single fineness standard, surpassing any of the individual

State specifications in order to meet all standards with a single product. Tennessee and Kentucky specify that 80 percent pass a 10 mesh sieve while, in Illinois, Missouri and Mississippi, 80 percent must pass an 8-mesh sieve. Fineness of grind is held to about 85 percent minus 8-mesh.

A pulverizing plant was built at Krause in 1926, adjoining the main plant. In 1937, a second pulverizer was installed and, in 1944, a third unit went into production to raise the agstone capacity to 150 t.p.h. To achieve this capacity required considerable new material handling equipment, increased bin capacity and necessitated increased power facilities. The three pulverizers,

alone, have increased the installed power load by 600 hp.

The Krause plant has one of the finest Diesel-generator power plants in the industry with an installed capacity of 2425. hp. The original installation, in 1936, had two 4-cycle, cold-starting mechanical injection engines, an 8-cylinder engine rated at 525 hp. and a 6 cylinder rated at 400 hp. A year later, a 6 cyl., 500-hp. engine was added and, in 1944, when the plant power load again was increased, a 1000-hp. supercharged Diesel went into service. The company has standardized on National Superior Diesel engines and has an aggregate of 4000 hp. installed in the various plants. At Krause, full production necessitates operating the power plant at 90 percent of full load.


Under average conditions of production, the cost of power generation is  $7\frac{1}{2}$  to 8 mills per kw.h. and the power demand is approximately 2.5 kw.h. per ton of stone produced. It compares with a cost of 2.1c per kw.h. for purchased electric power.

The pulverizing plant is adjacent to the main plant and has individual overhead steel bins serving the three pulverizers. The original mill, an American type ACS-3 was converted from a ring mill to a hammer mill and is fed from an 85-ton bin by an F45-100 Syntron electric vibrating feeder. In 1937, a 30 x 40 hammer mill with a 75-ton Butler bin and an F5-100 feeder of the same type and make went into production. The 1944 installation is identical to the original one made in 1926, and has a 65-ton feed bin. All three units are so located that the bins may be filled by common equipment and the mill discharges may be handled by a single bucket elevator.

There is a two-way connection to the main plant, by belt conveyors, so that any practicable size (minus 2-in.) of stone may be sent to the

(Continued on page 84)


**Why make hay balers of your cows?**



**HAY PRODUCED WITHOUT LIMESTONE**

Alfalfa - 18 lbs.  
Soy beans - 27 lbs.

**in order to get 2 lbs. of protein a day, a cow must eat....**



**HAY PRODUCED WITH LIMESTONE**

Alfalfa - 11 lbs.  
Soy beans - 15 lbs.

**FEED YOUR COW BY FEEDING THE SOIL**

**Feed your soil by using COLUMBIA or VALMEYER HIGH CALCIUM LIMESTONE**

Display poster distributed to agstone dealers



F. D. Cline Construction Company, Raleigh, North Carolina, recently completed widening of this access road to a U. S. Marine Corps Air Station and a U. S. Navy Base in eastern North Carolina. Work involved grading of more than 150,000 yds. of earth and the use of more than 70,000 yds. of concrete for paving. Gulf quality lubricants and fuels helped the contractor get top performance from equipment.

## GULF QUALITY PRODUCTS

and fine service help contractor make  
fast time on North Carolina road job

**G**ULF QUALITY PRODUCTS and fine service are a big help on a rush job like this," says Superintendent E. Claude Willard of F. D. Cline Construction Company, Raleigh, North Carolina. "They contribute to fewer delays in the operation and maintenance of equipment, and help insure top performance from every unit."

This access road project is one of many rush jobs where Gulf products and prompt delivery service work effectively to insure fast progress for the contractor.

Here's why so many leading contractors specify Gulf products: They have found that Gulf lubricants provide a higher degree of protection to equipment when it's pushed to the limit—and fuels of uniform quality that contribute to maximum power and effi-

ciency. Result: fewer delays, lower maintenance costs, and better all-round job efficiency.

Call in a Gulf Service Engineer before you go to work on your next contract—let him show you how Gulf quality lubricants and fuels can help you do a speedier, more profitable job. Write, wire, or phone your nearest Gulf office today.



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## GRINDING MILLS



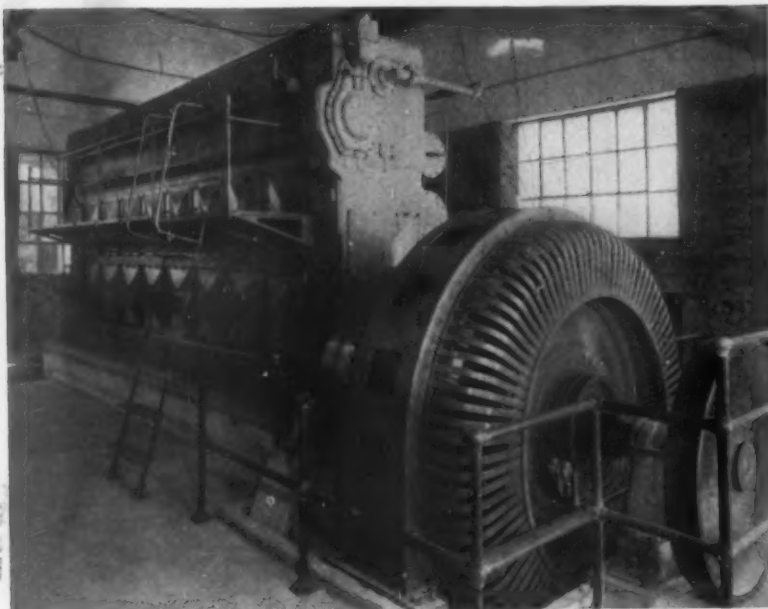
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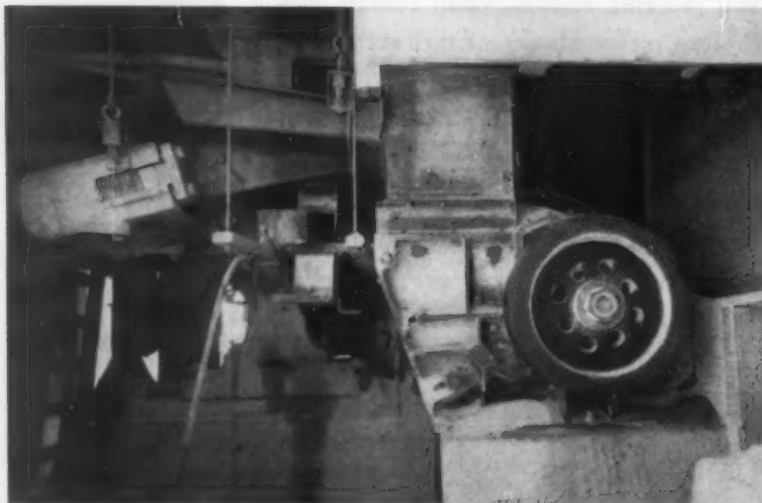
ENGINEERS AND  
MACHINERY MANUFACTURERS

NEW YORK, N. Y.





New 1000-hp. Diesel engine installed at Krause No. 1 plant in 1944



Electric vibrating feeder regulates flow of stone from overhead bin into pulverizer at Krause plant



Interesting view of original quarry and crushing plant taken in 1906.

(Continued from page 81)

pulverizer bins and the pulverizer agstone product may be elevated and returned to a 100-ton railroad loading bin in the main plant. Incidentally 12 to 16 percent of the tonnage regularly processed through the main crushing plant is of agstone finess and is screened into this bin.

Considerable stockpiled stone in the 1½- or 2-in. minus size ranges is pulverized into agricultural limestone, thus enabling the pulverizing plant to operate independently of the main plant. In 1944, a 9- x 26-ft. track hopper, 24-in. by 28-ft. pan conveyor under it and a 24-in. inclined bucket elevator, on 85-ft. centers, all designed and furnished by the Stephens-Adamson Manufacturing Co., were installed to speed up the transfer of stone from stockpiles into the pulverizer feed bins. Stone from gondola cars discharges into the hopper and is fed through four 18- x 18-in. rack-and-pinion gates to the pan conveyor and is elevated at 200 t.p.h. for discharge through spouts into the several bins.

The electric vibrating feeders regulate the flow of stone from the bins into the pulverizers which are in closed-circuit, through a 90-ft. bucket elevator, with a 5- x 14-ft. Ty-Rock double-deck vibrating screen. Stone retained on the top deck, ¾-in. sq. openings, is returned into the pulverizers and that retained on the lower deck, 5-mesh, is a chip size re-screened over a 4- x 8-ft. single-deck vibrating screen, also with 5-mesh cloth, and placed in a bin. The throughs are finished product, either conveyed to the railroad bin or to a new 200-ton truck-loading bin over a 24-in. belt conveyor. Agstone is stockpiled by gondola cars, which are hauled to and from the plant by a 250-hp. Plymouth gasoline locomotive.

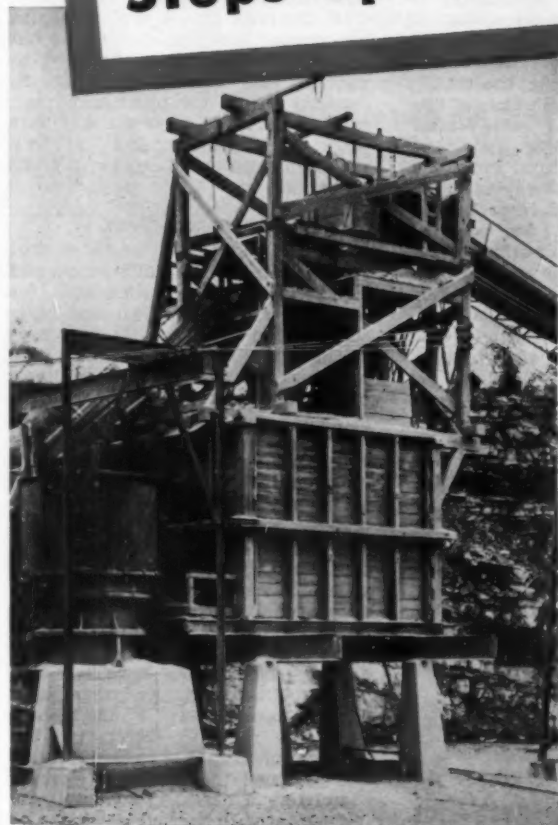
The pulverizers are operated around-the-clock when necessary, under full load. Oversize motor drives with increased pulverizer rotation speed have stepped up capacity, and the electric vibrating feeders contribute to the maintenance of a uniform high rate of feed into the pulverizers. With the electric type feeder, adjustable rheostat control on the electrical control board is instrumental in holding the desired amperage input to the pulverizer motor within close limits.

Stone is pulverized regardless of moisture conditions with the help of improvised coal burners to heat the underside of the feeder pans. Direct application of heat tends to dry the stone a little but the purpose of the burners is to prevent gumming up of the pan which they do nicely, so well in fact, that electric heating devices will be installed. The larger mills have ½-in. grate openings and

(Continued on page 108)



# Modernization with **TELSMITH** Steps-up Quarry Plant Output



New intermediate-crushing plant, with 16-B Telsmith Gyratory Crusher and 2-deck 4' x 12' Pulsator Screen

• War plant projects, strategic road construction, airport developments, essential municipal and state highway maintenance in the Reading, Pa. area, imposed new and heavier demands on the Berks Products Corp. rock crushing plant.

To turn out 1500 tons a day *consistently* with an increasingly larger percentage of finer sizes, called for plant modernization. But wartime restrictions meant less manpower and a minimum of new equipment. Yet maximum operating efficiency was built in by using the right Telsmith equipment.

Roundabout handling and material flow bottlenecks were eliminated by relocating the primary jaw crusher down on the quarry floor and building a new conveyor-connected screening-and-intermediate-crushing plant half-way up the incline. Its 16-B Telsmith Gyratory Crusher takes the oversize from a Telsmith 4' x 12' 2-deck Pulsator Scalping Screen located above a 125-ft. bin for 3 sizes of product.

This relieves main plant screen from coarse scalping duty, gives far better classification, and faster, more flexible secondary crushing. And, in the main plant, the installation of a No. 48 Telsmith Gyrasphere Crusher, in closed circuit with the screens, assures top tonnage of fines in all desired sizes.

Planning future modernization, expansion, or a complete new plant? Consult Telsmith engineers. Get Bulletin E-11.

Q13

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Knoxville 8, & Nashville 6, Tenn.

# Improving Distribution

**Marble Cliff Quarries Co., Columbus, Ohio, has set up auxiliary crushing and distributing plants for agricultural limestone**

By H. E. SWANSON

**P**RODUCERS of agricultural limestone in the State of Ohio have come a long way in their efforts to increase production through more uniform distribution of sales throughout the year. The accompanying chart, showing the percentage of annual agricultural limestone sales per month, was compiled from reports of members of The Processed Limestone Association, Inc. It indicates how effective the promotional efforts of this organization of producers, in conjunction with other interested agricultural agencies including the Agronomy Department of the University of Ohio, have been in educating the farmer to spread agstone the year around. The Spring and Fall peaks have been materially reduced in the last several years.

What this long-range educational program has meant to an individual producer is clearly evident in the table on page 88, showing how the



Agstone pulverizing plant on the outskirts of Columbus, Ohio. Note portable loader to the left

monthly percentages of annual total tonnage for the Marble Cliff Quarries Co., Columbus, Ohio have taken a trend toward more uniformity. It will be noted that the percentage of volume has decreased 15 percent for the month of April over a 10-year span and six percent for the month of September, with adjustments upward in the Summer and Winter months.

Demand for agricultural limestone has increased tremendously in Ohio, in fact it had jumped from 103,000 tons in 1932 to 1,521,000 tons in 1943. More uniform distribution of sales over the years has enabled producers to increase their volume of sales considerably, in fact an accompanying article indicates that the increase is upwards of 30 percent for that reason alone.

However, increases in plant hourly production have been necessary, as well, to keep pace with the tremendous increase in demand. The Marble Cliff Quarries Co. is typical of the big crushed stone producer that has had to supplement normal plant production with additional pulverizing capacity within the plant and, later, with production from an auxiliary plant. This has been done at both the Columbus and Lewisburg, Ohio, operations.

## Columbus Plant

The Columbus plant has been producing burned lime, flux stone and commercial crushed limestone for many years. Until 1943, the agricultural limestone was largely produced through a 24- x 36-in. Jeffrey hammermill. In 1943, an auxiliary plant went into production, independent of the main plant, to pulverize agricultural limestone from stockpiled stone.

This plant, illustrated herewith, is a simple operation, but, with a regulated size of feed, has been effective in materially increasing total production, independent of the main plant. Stone is trucked from stockpiles and dumped into the boot of an enclosed bucket elevator for transference into an overhead steel bin for feed to a 12- x 24-in. Eagle crusher. Originally, the crusher discharge passed over a single-deck Simplicity vibrating screen and the oversize (practically all plus 8-mesh), was returned to the bucket elevator completing a closed circuit.

After some experience with this plant, changes were made to increase its capacity from 20 or 25 t.p.h. to approximately 40 t.p.h. One of the operating difficulties was in connection with tramp iron entering the crusher and another was the lack of uniformity of feed to the crusher from the bin directly overhead. A



Columbus, Ohio, main plant produces part of the agstone. A 24x36-in. hammermill pulverizes the agstone. Lime is also manufactured



# NORDBERG

## *Announces* a line of

### BASIC PROCESSING MACHINERY

For more than fifty years Nordberg has been building heavy equipment for mining, chemical, cement, and allied heavy industrial fields. These many years of experience, engineering "know how" and manufacturing facilities are now available for supplying machinery through a Nordberg subsidiary serving the industries which process basic materials. With the long

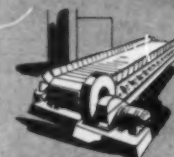
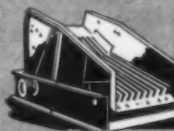
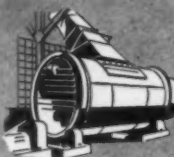
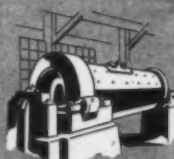
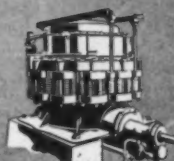
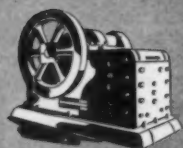
established line of Nordberg products augmented by an extensive line of processing machinery, it is possible to select much of your equipment from one company—with one responsibility. The better design and construction which has always characterized Nordberg machinery is assurance of that dependable performance so long enjoyed by satisfied Nordberg users.

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Copper Converters • Casting Machines  
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*If you are planning an expansion of your present operations or building a new plant that will require any of the above equipment, let us give you further particulars on machinery and services which are available without obligation.*

## NORDBERG PROCESS MACHINERY CO.

60 E. 42nd St., New York City, N. Y.





Convenient agstone pulverizing plant at Columbus, Ohio. Stockpiling conveyor may be seen in the center with railroad siding to the right

Dings magnetic separator recently was installed in the chute carrying the bucket elevator discharge into the bin. A second improvement involved re-setting the crusher and

The latter plant is very similar to the auxiliary installation at Columbus, Ohio, except that it is an open circuit operation. A 30- x 24-in. Jeffrey hammermill is fed stone from

## PERCENT OF YEAR'S TONNAGE SOLD BY COMPANY EACH MONTH

Month	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944
January	.02	.01	.02	.01	.01	.01	.02	.02	.02	.05
February	.02	.03	.02	.02	.01	.02	.03	.03	.02	.03
March	.12	.06	.06	.06	.08	.04	.06	.06	.06	.03
April	.20	.14	.21	.16	.12	.10	.19	.15	.10	.06
May	.09	.09	.10	.09	.15	.16	.15	.13	.08	.11
June	.06	.03	.02	.05	.03	.04	.02	.05	.08	.08
July	.03	.06	.02	.05	.04	.04	.03	.05	.07	.11
August	.10	.21	.15	.14	.15	.11	.11	.13	.12	.14
September	.22	.23	.27	.25	.24	.26	.17	.16	.14	.16
October	.10	.09	.08	.11	.12	.17	.08	.13	.12	.14
November	.03	.03	.04	.05	.04	.03	.05	.06	.10	.08
December	.01	.02	.01	.01	.01	.02	.07	.03	.09	.02
Totals	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

installation of a Jeffrey vibrating feeder under the hopper discharge ahead of the crusher. The 3- x 5-ft. vibrating screen was replaced by a 3- x 8-ft. Simplicity "ball-tray" vibrating screen.

In the plant producing flux stone, a 12- x 24-in. Eagle crusher and a 4- x 12-ft. Simplicity single-deck vibrating screen were installed in 1944, increasing the agricultural limestone production of that plant to 20 percent of the total output. Thus, agricultural limestone is produced at three locations in Columbus at one plantsite.

## Lewisburg Plant

At Lewisburg, Ohio, where production is divided approximately equally between burned lime, flux stone and agricultural limestone, capacity for the latter has also been increased. In the main screening plant, fines from the crushing and screening of kiln stone and flux stone, are stored in an agricultural limestone bin. One of the sized products,  $\frac{3}{4}$ - to  $\frac{1}{2}$ -in., is placed in bins for recrushing into agricultural limestone. This stone is hauled to an auxiliary agstone plant.

from stockpiles. The latter product, formerly shipped for kiln feed to Columbus, has accumulated in stockpiles. Reduction to agstone will increase production at this plant by 50 percent.

About 50 percent of the production at Columbus is shipped by rail into Ohio and West Virginia. The balance is delivered by truck on contracts with about 50 trucking companies which have spreading equipment. At Lewisburg, the entire production is handled by trucks, sales being f.o.b. plant, and tonnage is moved by 20 established dealers, owning their own trucks and spreading equipment.

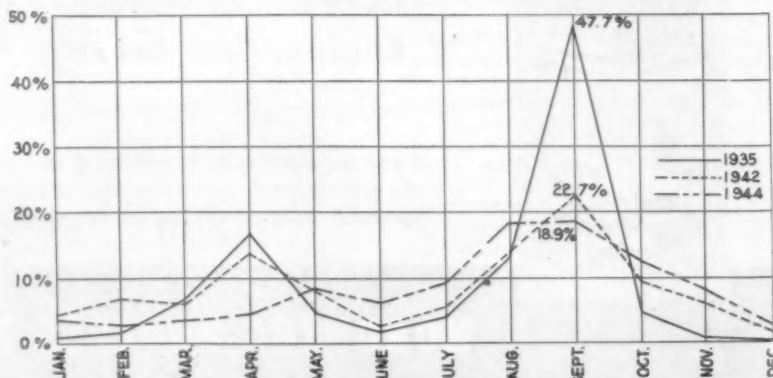
## Promotion

W. H. Margraf, manager of the Processed Limestone Department of the company, is a past president of The Processed Limestone Association, Inc. and has been actively engaged in the State-wide program of education to encourage farmers to make application of agstone to their fields in the Summer and Winter months. It has been a highly successful joint effort by producers individually, agricultural agencies and the State association.

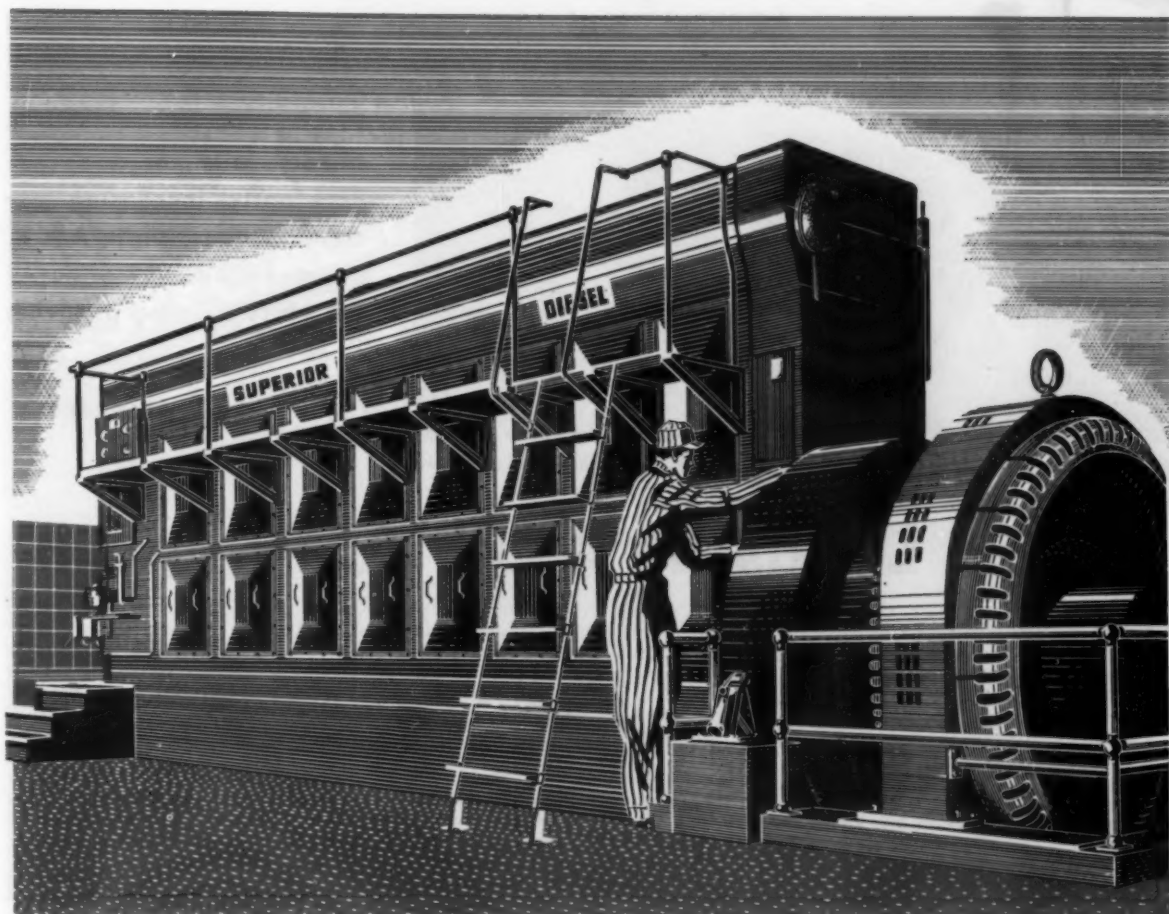
W. H. Hoagland is chairman of the board of Marble Cliff Quarries Co.; H. J. Kaufman is president; Russell Rarey, vice-president; E. J. Kaufman, general manager; Robert N. Pausch is secretary and treasurer; and A. W. Brown is general superintendent. C. W. Geiger is superintendent at Columbus and James Leonard at Lewisburg, Ohio.

## Soldiers "Borrow" Gravel

J. H. GALLAGHER, Corvallis, Ore., and J. Ira and Earl L. McNutt, Eugene, Ore., recently won their claim for \$10,000 damages from the government in federal court at Portland, Ore. The construction firm charged soldiers hauled away 10,000 cu. yd. of sand and gravel from Polk county stockpiles to use on Camp Adair roads.



Graph showing percentage of agstone sales per month in Ohio for the years 1935, 1942, and 1944 prepared by P. E. Heim, of Carbon Limestone Co., from reports of members of The Processed Limestone Association, Inc. Note how big seasonal peak from August to October has been flattened out



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**SUPERIOR DIESELS** • STATIONARY, 10 to 1325 H. P.  
MARINE, 28 to 1325 H. P. • GENERATOR SETS, 20 to 928 kw.





One of the largest portable agricultural limestone plant operators is Don Butler, Franklin Grove, Ill., in Lee County. This is the Stone Ridge quarry

**Production of agstone in Illinois fails to meet the constantly increasing demand. Reduction in A.A.A. payments has not affected the state's liming program**

By JOHN R. SPENCER\*

## Illinois Leads in A. A. A. Program

**A**PLICATION of agricultural limestone to neutralize sour or acid soils has now become a common practice of Illinois farmers. No good farmer would fail to haul out and spread on his fields all of the manure his livestock produces and now, because he has seen its value so abundantly demonstrated, neither will he fail to apply limestone about every other rotation. They know the value of limestone and this value has increased with higher farm prices. This was not true in the early days when progressive farmers withstood the ridicule of neighbors to put "sweetner" on the soil, following recommendations of the University of Illinois, College of Agriculture as the first step in a permanent system of soil fertility promulgated by Cyril G. Hopkins.

### Program Continues with Less A.A.A. Money

The present very large annual tonnage spread in Illinois (largest of any state in the Union) ranges from 15 to over 20 percent of the total applied in the United States. Tonnage of limestone used shows a steady rise over the last 10 years. In 1935 the amount was approximately 500,000 tons which increased to 3,866,000 tons in 1942, the high point, and dropped about 20 percent in 1943 to 3,113,000 tons due to shortage of labor, trucks and repairs for equipment. With similar conditions prevailing in 1944, the tonnage estimate is around the 3,500,000 figure with some quarries reporting substantial increases and others in labor deficient areas a smaller production. It is of interest to note that in the 10-year period, approximately 95 percent of the total tonnage used is produced within the state's borders.

\*Director, Soil Improvement Department, Illinois Agricultural Association.

The A.A.A. soils program encouraged liming, and has without doubt been a substantial factor toward increased usage of the material in the last five years. At first limestone was distributed by "Grants of Aid" and later with what is termed, "Practice Payments." In the southern Illinois counties, A.A.A. has been paying directly for approximately 65 percent to 70 percent of the limestone applied with a lesser percentage in central Illinois and the smallest in the northern part of the state. The overall percentage is about 33½ percent of the total applied (credit, of course, is given for much larger additional tonnage purchased direct by cooperators). A.A.A. has been compensating farmers in past years according to the farms' earning units for about 80 percent of the cost of limestone spread on the field. In 1945, some reduction was made on the payments for liming in a number of counties, many dropping to approximately 70 percent of the cost. In some other counties, however, a small increase in payment rates per ton occurred.

With the reduction in payments in a number of counties, some quarry operators thought there might be a decreased demand but a survey of the facts will refute this fear without question. In 1944, according to a spring survey by the A.A.A., Illinois farmers planned to use 6,500,000 tons of limestone and thus if the production estimate of 3,500,000 tons is correct there was an apparent shortage of about 3,000,000 tons for the year.

### Production Fails to Meet Demand

There are several examples to prove this point. In a recent survey in the four counties around LaSalle, Ill., there was an apparent deficit of 75 to 80 thousand tons that would have been used last year if materials had been obtainable. Another survey in the four-county area around Springfield showed about 14,000 tons less applied than the previous year, not because of lack of demand, but because of less available supplies. In the four-county area around Dixon

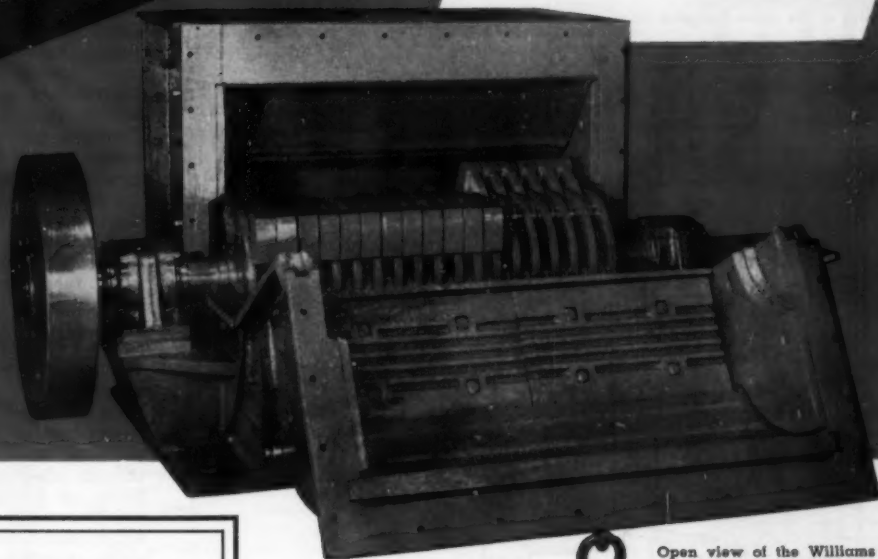
(Continued on page 92)



Mississippi Lime Co., plant along the river is one of several operated by this company. A large volume of agstone is produced at this big plant

**DESIGNED  
ESPECIALLY FOR  
AGSTONE**

**WILLIAMS  
"NF" HAMMER  
CRUSHER**



Open view of the Williams "NF" Mill showing heavy duty hammers, grinding plates, side liners and cover liners. Also shows easy accessibility to mill for repairs, etc.

## FEATURES OF THE "N F"

- Adjustable grinding plate.
- Hammers adjustable to overcome wear.
- Larger capacities.
- Lifetime construction.
- 2" top liners, 1" side liners.
- Easy to work on—hinged cover.

The Williams "NF" Hammer Crusher was designed especially for reducing 4" or smaller stone to  $\frac{3}{4}$ ",  $\frac{1}{2}$ " or agricultural limestone. Embodies all the outstanding features Williams has developed in hammer mill design and construction and has proved itself an outstanding performer in the field.

The "NF" is built in a large range of sizes with capacities from 9 to 35 tons per hour when making agricultural limestone, affording a size mill for any job. Its principles of operation—a combination crushing and grinding—enables it to make agstone that meets rigid size specifications at a good margin of profit to producers.

"We appreciate your inquiries—write today for additional information—no obligation on your part."

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**WILLIAMS**  
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD  
**WILLIAMS**  
PATENT CRUSHERS GRINDERS SHREDDERS



Representative of the smaller crushed stone plants is the efficient layout of Jonesboro Stone Co.



Operating quarries in Illinois counties and some quarries in other states supplying agricultural limestone to Illinois farmers

(Continued from page 90)

which applied 306,000 tons in 1944, it was reliably estimated farmers would have used 90,000 tons additional, if available. Further illustrating the demand, in this area there are about 20 producers whose output range from 50 tons per day to about 700 tons, and with one exception all operate portable crushers, several of which produce an impressive daily tonnage.

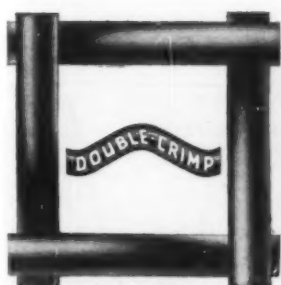
As of March first, there are very few substantial storage piles of agricultural limestone at any of the 135 producing quarries from which the state secures this essential soil building material (see map). Getting an exact count on operating quarries is similar to counting a school of fish since break-downs occur, labor is short, shut-downs are common in winter, portable operations move to different pits and new quarries develop. In this latter classification, 21 new producing quarries came into the picture during 1944, reversing the downward trend that had occurred, and thus there was a slight increase in number over 1943. Last but not least, farm income is high with all indications of this trend continuing for some time in the future. Pointing toward a steadily increasing demand for limestone is the soil consciousness developed over the years by agricultural extension education assisted by governmental action agencies and the high level of farm income. Although substantial progress has been made on liming Illinois farm soils, the University of Illinois, College of Agriculture recently estimated that while slightly more than one-third of the crop and pasture land has been adequately limed, there still remains some 13,000,000 acres needing treatment. If this could all be done at one time, it would require more than 40,000,000 tons. A maintenance ration to keep the soil in a neutral or sweet condition requires a tonnage of about 2,500,000 tons annually. Limestone is essential to soil fertility maintenance and improvement and is especially important in a war time food production program. Regardless of war, farmers cannot afford to falter in the soil building program.

Three questions in the 1945 limestone picture are: (1) will the present labor shortage become more serious? (2) are there enough trucks for hauling and spreading? and (3) will the supply of rail cars for shipping be adequate?

## Fertilizer Materials

Mixtures of superphosphate and serpentine for fertilizer purposes have been tested by the Rothamsted Experimental Station in England. Flue dust also is being tested for its potash content. A project for the erection of a plant to extract potash from flue dust has been abandoned.

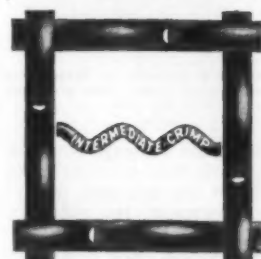




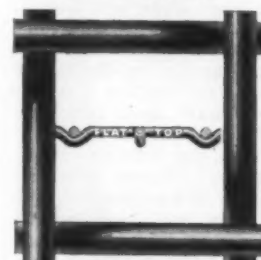
Double-Crimp



Arch-Crimp



Intermediate-Crimp



Flat-Top

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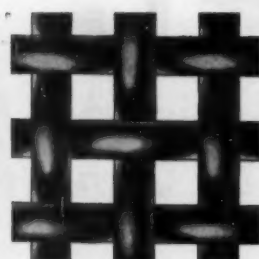
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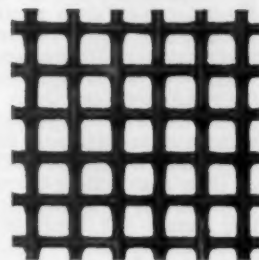
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

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Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium Alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-Crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selva-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Twisted-Fill	Painting	Rolls
	Twisted-Warp	Shearing	Sections
		Sitting	Segments
		Trimming	Spacers
		Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

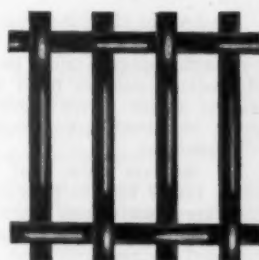
We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



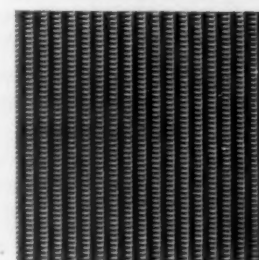
Double-Crimp



Galvanized



Rek-Tang

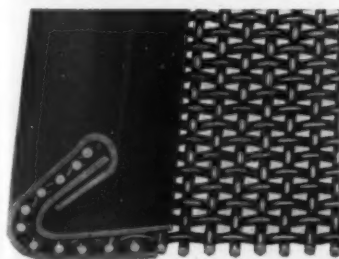


Dutch Weave

## The LUDLOW-SAYLOR WIRE COMPANY

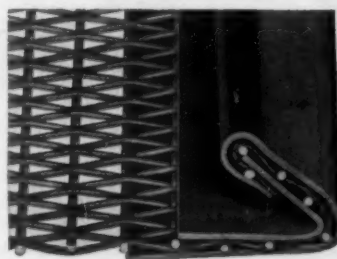
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LUDLOW-SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled—quickly installed—need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloth and woven wire screens, which may be custom-finished with attachments to fit your particular processing installations.



# Liming Materials and the Conservation Program

By D. W. AITKEN\*

**P**ROGRESS made through the agricultural conservation program in expanding the use of liming materials is indicative of the success in stimulating interest in basic soil conserving and soil improving practices. There has arisen a new and clearer understanding not only of the war-time value of these practices but also of their importance from the long-term viewpoint. Active programs of this nature will continue to be an important means of emphasizing the worthwhileness of conservation farming.

To combat the forces tearing down the fertility of our soil resources, constant vigilance must be exercised. Remedial measures must be as persistent as the forces themselves and must, in addition, be intelligent and well-planned.

To discover how best to battle these forces and to instruct farmers in proven techniques is the responsibility of federal and State agencies engaged in research and education including field demonstrations. A.A.A. does not seek to duplicate the activities of these agencies. Instead it leans heavily upon them for advice and assistance.

A.A.A. takes to the individual farmer a program of proven practices for saving and building up the soil on his farm. Soil is the farmer's chief capital asset. At the same time it is part of the nation's heritage, of which each farmer is steward of a share. The A.A.A. program appeals both to his self-interest, as tiller of soil, and to his trusteeship of a portion of the nation's natural resources. It seeks to

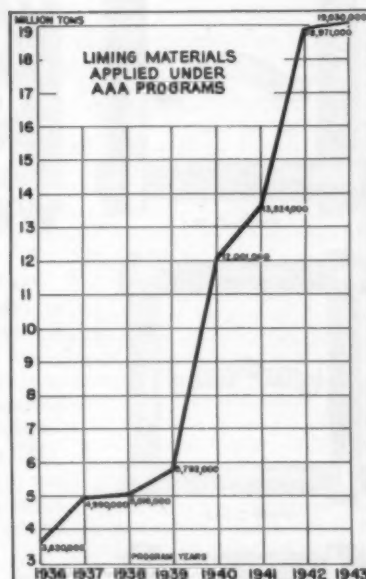
\*Office of the Chief, Agricultural Adjustment Agency.

induce him to make soil conservation an integral part of his farm planning in order to assure himself higher yields and his posterity better soil.

Two-thirds of the six million American farmers are regular participants in the A.A.A. agricultural conservation program. This means they carry out one or more of the several practices on which assistance is offered. These practices were recommended by farmers themselves with advice from federal and State agencies and technicians. They are selected for their local adaptability. All farmers, whether small or large, are given full opportunity to participate.

The Soil Conservation and Domestic Allotment Act authorizes annual expenditures up to one-half billion dollars for assistance to farmers in soil conservation. This is implemented by annual appropriations of funds which are by formula divided among States. For 1945 the amount is 300 million dollars. Practice payment rates are established in relationship to the cost of performing the various practices, and with a view to emphasizing their relative importance in each area of the country. By Congressional mandate, small payments are automatically increased to provide additional inducement to the small farmer.

Emphasis has been placed upon practices involving the use of materials since early in the development of the program. Most important of these are applying phosphates and liming materials and seedings of certain legumes and grasses. Good progress has been made with all of them. Land customarily left uncovered during the winter or during summer



Curve showing rapid increase in tonnage of liming materials applied under AAA programs from 1936 to 1944

fallow periods now is being sown to cover crops. These dual-purpose crops resist erosion of the soil and, at the same time, augment its nitrogen supply.

Much of the nation's soil is starved for phosphate as well as for calcium. Throughout large areas, fertilizer use has been small. Farmers have not recognized the economic advantage of applying minerals for the benefit of the entire crop rotation. Pastures and meadows have been taken for granted along with rain and sunshine. Through the inducement offered by payments, farmers have used large quantities of phosphate on soil conserving crops and have become staunch supporters of the practice. Manufacturers have increased their production and are studying the great potentialities of their product.

Likewise with liming materials, it wasn't that many good farmers didn't lime their soil. It wasn't that research and education hadn't pointed the way. But the volume used was small; the basic requirements of the soil were far from being met. Farmers were quick to recognize the value of the practice, once A.A.A. included it as a soil conservation measure. Progress has been made each year in adding new farmers to the roll of lime enthusiasts.

## 1944 to Show Increase

The accompanying graph indicates the consistently heavier tonnage moving to farms year after year. It does not include the 1944 program year, for which complete figures are not yet available. However, it is apparent that the 1944 program will

(Continued on page 106)



Spreading agricultural limestone on a farm in Shelby County, Ill.

1942 1943

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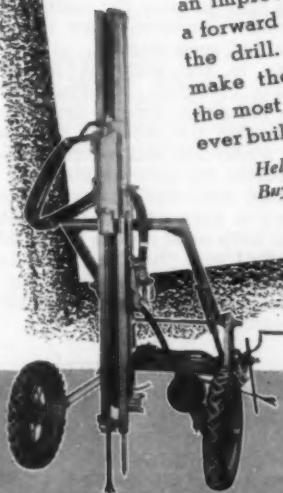
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## 1 for PRIMARY drilling... CLEVELAND WAGON DRILLS

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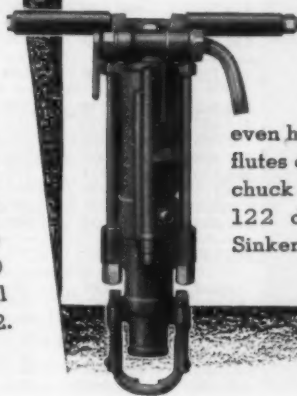
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# LEADERS IN DRILLING EQUIPMENT



# Expect Large Post-War Market

National Crushed Stone Association convention reports on agstone indicate optimistic view of future

**D**R. WM. A. ALBRECHT, chairman, Soils Department, College of Agriculture, University of Missouri, spoke on "Mobilizing the Fertilizer Resources of Our Soils." His theme was similar to that published in *Rock Products*, April, 1944; in which he described the 10 or 12 most important elements in soil for life-sustaining purposes. Of these, calcium and magnesium (from limestones) are the most important. The main point of his address was that the application of liming materials to soils is vastly more important than merely neutralizing soil acidity. It is calcium as a plant food, and calcium

for its chemical functions in the soil that are all important.

Dr. Albrecht also emphasized the need for replacing other mineral elements in the soil. The old idea (spread by fertilizer manufacturers) that fertilizers had to be "water-soluble," is not borne out in nature, because of the interaction of the soil elements, with moisture, carbon dioxide, organic acids from plant decay, etc. Apparently, if the mineral elements are present in the soil, nature will find a way to utilize them.

WM. G. FINN, assistant chief, A.A.A., said that all interest in the use of agricultural liming materials is

by no means commercial. Just now the A.A.A. is chiefly concerned with the part of agriculture in the prosecution of the war, but an equally important concern will be the restoration of war-worn soils—soils that have been forced to produce their utmost. Those who build and maintain the soil, he said, must ever be aware of the effects of products of the soil on the minds and bodies of men; hence agricultural limestone producers have a key place in developments of the future.

## A.A.A. Policies

Mr. Finn said that in this country the 100th meridian was roughly the dividing line between soils with sufficient and those with deficient supplies of calcium—the west dry sections being supplied, and the more moist east not having enough. He sketched the progress in use of agricultural liming materials, which in 1929 was about 3½ million tons. Consumption went down during the depression years to 1½ million. He said the A.A.A. program for 1945 was about the same as for 1944. The estimated requirements by states are given in the accompanying table.

Mr. Finn said one important change in policy had been made by A.A.A. in 1945. Funds available for purchase of limestone for farmers have been reduced to 70 to 80 percent of the cash cost of the liming materials instead of 100 percent as formerly. Also, it is desired in the long run to get away from A.A.A. contracts with limestone producers, in favor of distribution through dealers or farmer cooperatives. He said the A.A.A. had been criticized for buying and stockpiling the limestone for long periods, but this criticism came largely from a misunderstanding of the purpose, which was only to have the material ready for any convenient time the farmer had for spreading.

As to the post-war market for liming materials, Mr. Finn exploded any fears that present demands have exhausted the need. He said, assuming leadership and a continuation of research, the restoration of our over-worked soils will insure an ever-expanding demand for soil rehabilitation. Soils must always be continually rebuilt, and the big question is whether we as a nation can keep ahead of exhaustion of our soil resources.

## Price Control

HENRY A. HUSCHKE, Agricultural Chemicals Section, Office of Price Administration, reviewed recent developments in price policy. While these have been covered in various articles in *Rock Products* during the past two years, the following extracts from Mr. Hushcke's talk, summariz-

LIMESTONE DISTRIBUTION AND REQUIREMENTS—AGRICULTURAL ADJUSTMENT AGENCY—JANUARY 25, 1945

Region and State	Total Distribution 1943	AAA Distribution 1943	AAA Distribution 1944	AAA Distribution 1945, Est. Requirements	Total Annual Need
<b>Northeast:</b>					
Maine .....	63,588	58,674	63,339	85,000	200,002
New Hampshire .....	16,269*	21,040	23,846	30,000	63,548
Vermont .....	62,219*	66,288	102,594	116,250	234,543
Massachusetts .....	37,467	31,467	56,063	63,000	150,670
Rhode Island .....	6,640	4,431	5,460	11,000	18,916
Connecticut .....	44,550	36,627	50,842	57,000	62,731
New York .....	521,766	361,772	583,540	800,000	2,188,116
New Jersey .....	160,583	54,037	105,069	100,000	248,426
Pennsylvania .....	1,121,000	555,783	925,933	902,750	1,556,253
<b>Totals .....</b>	<b>2,034,082</b>	<b>1,189,119</b>	<b>1,916,686</b>	<b>2,165,000</b>	<b>4,723,205</b>
<b>North Central:</b>					
Illinois .....	3,773,000	944,502	800,000	1,500,000	4,975,141
Indiana .....	1,264,531	916,667	900,000	1,100,000	2,349,286
Iowa .....	2,173,194	758,045	650,000	1,000,000	5,717,749
Michigan .....	325,000*	476,319	500,000	750,000	1,083,626
Minnesota .....	300,000	256,420	290,000	335,000	871,542
Missouri .....	1,482,982	948,719	1,150,000	1,300,000	4,248,300
Ohio .....	1,520,646	729,409	800,000	1,000,000	3,398,866
Wisconsin .....	1,120,636	615,686	1,275,000	1,800,000	2,495,475
<b>Totals .....</b>	<b>11,959,989</b>	<b>5,642,767</b>	<b>6,365,000†</b>	<b>8,785,000</b>	<b>25,139,985</b>
<b>East Central:</b>					
Delaware .....	27,301	4,300	17,334	20,000	73,215
Maryland .....	194,183	63,000	110,281	100,000	353,824
Virginia .....	690,000	473,000	681,106	650,000	2,157,312
West Virginia .....	450,000	360,000	512,929	450,000	1,513,750
North Carolina .....	543,950	460,000	422,500†	450,000	1,766,802
Kentucky .....	1,253,844	370,000	610,385	600,000	1,561,813
Tennessee .....	675,000	665,000	710,400†	700,000	1,878,912
<b>Totals .....</b>	<b>3,834,278</b>	<b>2,385,300</b>	<b>3,064,937†</b>	<b>2,970,000</b>	<b>9,305,628</b>
<b>Southern:</b>					
Alabama .....	192,614	194,256	237,021	165,000	1,299,658
Arkansas .....	51,448	51,177	67,921	77,000	433,263
Florida .....	121,172	7,699	5,154	47,000	142,782
Georgia .....	85,000	52,623	84,027	100,000	1,320,314
Louisiana .....	40,000	7,151	258,347	150,000	930,429
Mississippi .....	64,000	60,305	794,394	291,000	1,427,500
Oklahoma .....	55,919	15,244	326,020	300,000	1,208,634
South Carolina .....	132,000	134,551	457,801	360,000	1,645,297
Texas .....	2,870	800	10,083	63,000	2,334,712
<b>Totals .....</b>	<b>745,023</b>	<b>433,606</b>	<b>2,240,768</b>	<b>1,543,000</b>	<b>10,742,589</b>
<b>Western:</b>					
California .....	.....	.....	.....	.....	116,929
Kansas .....	122,215*	141,626	436,340†	650,000	1,111,000
Oregon .....	23,000	6,403	18,941	20,000	180,220
Washington .....	17,930	522	1,819	6,000	60,638
<b>Totals .....</b>	<b>163,145</b>	<b>148,553</b>	<b>457,100</b>	<b>676,000</b>	<b>1,468,787</b>
<b>Grand Totals .....</b>	<b>18,736,517</b>	<b>9,799,345</b>	<b>14,044,491</b>	<b>16,139,000</b>	<b>51,380,194</b>

\*To be corrected. †Preliminary.

(Continued on page 102)

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# Chemists' Corner

## Coarse Particles of Cement Are Aggregate?

By DR. STEVEN GOTTLIEB\*

A NOTEWORTHY and typical wartime development in Palestine has been the considerable increase of cement output. This was due to the change-over from production of portland cement to a new brand of blended cement, the quality of which has since proved to be satisfactory to such a degree that today, after 1½ years of experience with this new cement, it was decided not to revert to the production of normal portland cement.

### Unhydrated Cement

We know that when mixing water with portland cement, the depth of hydration on individual particles is very small; the reaction depends to a high degree upon the exposed surface of the grains, particularly during the first few weeks of hardening concrete. A substantial part of the cement remains unhydrated in the nuclei of the larger grains, thus representing a net loss for the hardening process.

Earlier it was assumed that those clinker grains, where the depth of reaction on the surface is small in comparison to the diameter of the unaffected nuclei, have definite functions to perform in the hardening process, as the unhydrated nuclei have to absorb water from the surrounding gel-structure. Today this view cannot withstand a closer examination of the facts. Much data prove that the chemical functions of unhydrated kernels are of secondary importance and that hardening of portland cement with water must be regarded primarily as a surface reaction where the available energies are the better utilized the higher the comminution and dispersion reached.

British Standard Specifications require for rapid-hardening portland cements a residue of not more than 5 percent on the 170-mesh sieve (88 microns). This corresponds to approximately 40-50 percent of particles larger than 30-micron size, and a specific surface area (Carman-Lea-Nurse permeability value) of 2600-3000 sq. cm. per gram, depending on the method of grinding. On the other hand, under laboratory conditions, up to 6300 sq. cm./gr. surface could be achieved from well-burnt portland cement clinker in a vibration-

mill, working on the principle of vibrating at a high frequency a batch of grinding balls and clinker. This fineness still did not represent the limit as regards utilization of cement strength-producing capacities. When hardened with water in "normal consistency" up to 28 days, much available energy still remained unused. Heat of hydration measurements, on subsequently reground and again hardened samples revealed that all the hardening energy was fully used up only when the sample was reground and hardened a third time.

### Expensive Fine Aggregate

There are considerations against the use of excessively fine cements, but on the other hand it is also clear that "coarser" grinding means a net loss of energy by degrading of valuable clinker—produced with great expenditure of labor, fuel and power—to ordinary concrete aggregate. Why not utilize this valuable clinker to a higher degree, give it a very high surface and replace the coarser particles in cement with some other suitably graded, unburnt but cheaper material?

The costs and the qualitative disadvantages of very finely ground cements must be reconsidered, as it is now proved to be good economy to expend more costs on grinding and increasing output by addition of a suitable, well-sized, inert material, mainly in the 30-200 microns range. By such a measure, power consumption per unit cement produced, fuel economy and output per worker will be much improved.

The replacement of coarser clinker grains by some other similarly graded material under closely controlled operational conditions, may also bring other advantages. Electrostatic charges may become more pronounced, causing a better dispersion and consequently more available surface. A small amount of coarse, porous chalk does not reduce strength; on the contrary, its effect may be regarded as beneficial from many aspects. By sucking up water from the fresh concrete (without disturbing workability) the actual ratio of water to cement is reduced and later, when partial pressure of the water above the porous particles is higher than above the hydrates formed on the surface of clinker particles, water will flow out of the pores of chalk,

### EDITOR'S NOTE

• THE AUTHOR, arguing that portland cement particles coarser than 30-microns in size never completely hydrate, and therefore serve no purpose other than expensive fine aggregate, would make a "blended" cement in which particles coarser than 30-microns would be any more easily ground, inert fine aggregate.

thus providing a sort of "inner curing" of the concrete, also reducing its bleeding.

### Tests of Laboratory Blended Cements

Preliminary tests in plant and laboratory were carried out in 1942 to put into practice this idea of producing a cement by mixing together several chemically different *well graded* compounds. A chalk-flint mixture, geologically belonging to an Eocene formation, was found suitable for producing the "coarse" particle size range, to replace clinker grains above the 40-micron size. The flint was hard and brittle, the chalk ranged from soft and porous to hard, the porous part having a pore volume up to 40 percent. In spite of the marked difference in hardness it was possible to grind a suitable "coarse" blend, of which the greater part was between the desired size limits. The material itself had no pozzolanic-hydraulic properties. Blending of "fine" (clinker—gypsum) to "coarse" (chalk-flint) was done in a long screw conveyor.

Table 1 shows quality data of the portland cement previously produced in comparison with the new blended cement "S," where 30 percent of the above described chalk-flint mixture was added to very finely ground clinker-gypsum. Under laboratory conditions 50 percent could be added, and the strengths of the resulting blended cement were still much higher than required by rapid-hardening standards. The fineness of the clinker fraction 0.3-30-micron was 6300 sq. cm. per gram, and the chalk-flint mixture was exactly between the size-limits of 30-200 microns as all remaining fines were removed by consecutive washings and decantations. (Table 2.)

Extensive laboratory tests proved that the excessive sensitiveness of high surface clinker to atmospheric influence was much reduced when blended with suitably composed inert material. This was due to a closer and more even packing of particles on the surface of the powder and to

\*Chemical engineer and technical manager, "Nesher," Ltd., Haifa, Palestine (portland cement manufacturer).





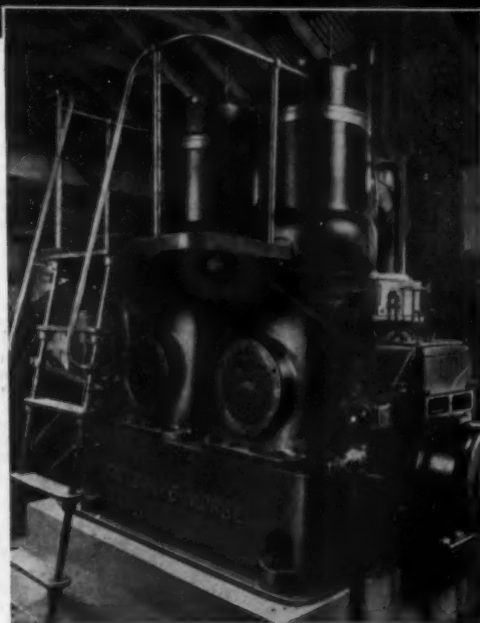
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## CHEMISTS' CORNER

the presence of porous moisture-absorbent grains. As the shortage of paper necessitated the packing of cement in jute sacks of inferior quality, this feature had considerable practical importance.

### Extensively Used

For practical work with the above blended cement, less aggregate is used to produce one unit volume of concrete than with portland cement under parallel conditions; and the resulting concrete though well graded in its finer parts and dense on its surface, is correspondingly leaner for a given mix and has also a lower volume weight. The mortar dumps, spreads, screeds and finishes easily and is cohesive, workable and uniform throughout. Judging by its good waterproofing property and resistance against aggressive solutions in comparison with the portland cement previously produced the new blended cement is also more durable, as waterproofing prevents the mortar from becoming saturated by aggressive fluids.

### Proved in Service

During 1½ years of continuous service for military as well as for civilian constructions in Palestine and its neighborhood, the new cement has proved its value. Demands were exceptionally severe. Because of the serious shortage of timber, steel and piping, the use of cement had to be extended to many new fields of service; furthermore, it was essential to strip forms after very short hardening times.

The change-over of production to a cement composed of several compounds, as explained in this article, is but one example to show how the strength of concrete and also other qualitative properties, such as shrinkage, waterproofing, resistance against aggressive solutions, etc., can be improved by mixing with a high-surface-area portland clinker, a carefully selected and processed unburnt material. Such a change-over, though requiring more cement machinery, particularly grinding equipment, may on the whole considerably improve economy of production and also make possible a more economic use of cement.

### Acknowledgments

I wish to thank the members of the engineering staff of the "Nesher" Cement Co. for their cooperation; particularly to Dr. A. R. Steinherr for labor grinding experiments and surface area determinations, to Mr. L. Klavansky for heat of hydration measurements, to Messrs. Reichenthal and Ben-Zion for mechanical testing of concrete and mortar, and to M. Blech for his assistance in putting the whole scheme into practical operation.

TABLE 1: COMPARISON OF BLENDED CEMENT WITH PORTLAND CEMENT  
Quality data of blended-cement "S" for the production of which 30% of chalk-flint blend was added to finely ground clinker + gypsum—in comparison to portland cement produced previously.

	Bl. Cement "S"	Cement Portland
Residue on		
Sieve No. 170 mesh.....	8.8%	4.1%
Sieve No. 72 mesh.....	3%	0.5%
<b>FINESSNESS</b>		
	Particles Smaller than:	
Particle size distribution, calculated from sedimentation accord. to the Pipette, method CaCl <sub>2</sub> as anti-coagulens, suspension in absolute alcohol, particles calculated as spheres.	80µ 88.5% 40µ 95.8% 20µ 98.8% 10µ 99.8% 5µ 100.0% 2.5µ 100.0%	95% 99.6% 100.0% 100.0% 100.0% 100.0%
Specific surface, calculated from Carman-Lea-Nurse permeability test .....	4200 sq. cm./gr.	2800 sq. cm./gr.
<b>WATER CONSUMPTION</b>		
"Normal consistency" for setting time accord. B. St. Sp. f. Portland cement.....	21.7%	21.1%
Setting time .....	Init. 1.30 hrs. Fin. 3 hrs.	Init. 1.30 hrs. Fin. 3 hrs.
Gauging 3:1 Standard-sand and cement.....	8.2%	7.8%
Compression test with vibration machine accord. B. St. Sp. f. Portland cement.....	10%	10%
Flexural and compression strengths in "plastic" consistency accord. Swiss Standard Sp. f. Portland cement .....	11%	11%
Soundness, Le-Chatelier-test .....	ϕmm.	ϕmm.
<b>STRENGTHS IN MORTAR</b>		
Tensile strength accord. B. St. Sp. 1 day	400	320
1:3 mix with stand. sand, specimen stored in water of 17-20° C. (lbs. per sq. in.) 3 days	535	477
7 days	565	512
28 days	620	602
Compression strengths accord. B. St. Sp. 1 day	2130	1720
1:3 mix with stand. sand, vibrated, stored in water of 17-20° C. (lbs. per sq. in.) 3 days	4970	4210
7 days	5880	5390
Flexural strengths accord. Swiss St. Sp. 1 day	394	254
1:3 mix with stand. sand, stored in water. 3 days	690	628
7 days	791	749
(lbs. per sq. in.) 28 days	879	824
(beams, 4 x 4 x 16 cm.) 3 months	900	873
Compression strengths accord. Swiss St. Sp. 1 day	1810	1315
1:3 mix with stand. sand, stored in water 3 days	4820	4060
7 days	5460	4870
(lbs. per sq. in.) 28 days	6650	5800
3 months	8400	8400
<b>CONCRETE</b>		
Concrete Strengths:		
1:2:4 mix by weight, corresponding 300 kgs. of cement in 1 cub. metre concrete 2 days	2540	2390
Angular limestone aggregate, max. size 30 mm., beach sand and sea-shells as fine aggregate. Fineness modulus accord. Abrams — 5.8, slump = 3 inches, stored in air at temp. ranging 19-29° C. and rel. humidity of 45-60%, 20 x 20 cm. cubes tested, expressed as lbs. per sq. in. 3 days	3170	3100
7 days	3680	3680
<b>SHRINKAGE AND HEAT EVOLUTION</b>		
Shrinkage tests:		
Beams 4- x 4- x 16-cm. 1:3 mix with stand. sand, 15% of water giving sloppy consistency of mortar stored in air, temp. changes 17-33° C., rel. hum. 24-100%. 7 days	-0.28	-0.36
28 days	-0.35	-0.55
3 months	-0.47	-0.71
1 year	-0.60	-0.83
Results expressed as change of length, mm. per metre.		
Heat evolution during hardening 300 gram cement + 75 gram water in a vacuum vessel, temperatures were read every 15 minutes, max. temp. in C.° noted.....	60	77

TABLE 2: TESTS OF THE RESULTING BLENDED CEMENT\*

	1 cement to 3 parts of standard sand, 11% water				1 cement to 1 part of sea-sand (very fine) and 2 parts of standard sand (1:1:2 mix) 12% water			
	Water Stor.	Comb. Stor.	Water Stor.	Comb. Stor.	Water Stor.	Comb. Stor.	Water Stor.	Comb. Stor.
Beams, 4- x 4- x 16-cm. .... 3 days	757	777	933	1023	738	769	960	1023
Flexural strength .....								
Lbs. per sq. in.								
Compression strength .....	6240	6560	7850	8740	5900	6630	9000	10500
Lbs. per sq. in.								

\*Portland cement clinker was ground in a laboratory "Vibrator" mill to 6300 sq. cm./gram surface area (accord. to Carman-Lea-Nurse permeability method) and 50% of chalk/flint blend approx. size range 30-200 microns, was admixed.

# HOW LIMITAMP CONTROL PROTECTS YOUR MOTOR

**1/2-CYCLE OPERATION clears  
high-voltage fault currents before  
they can do harm**

**L**IMITAMP control, for use with squirrel-cage, synchronous, and wound-rotor motors, provides fast, positive short-circuit protection so necessary for safe operation at high voltages.

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**Noiseless in Operation**—Limitamp control works silently. Operators are not startled by any part of its operation. Even when a fuse blows, there is no noise. There's only a plainly visible bulge in the end of the fuse.

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## A. A. A. Policies

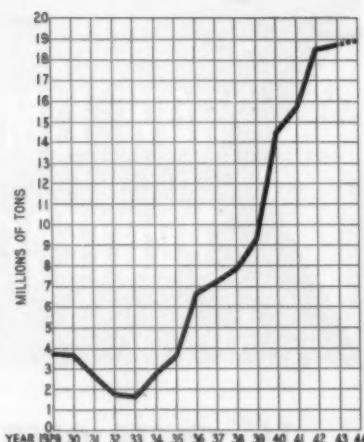
(Continued from page 96)

ing developments and results, should prove helpful to producers:

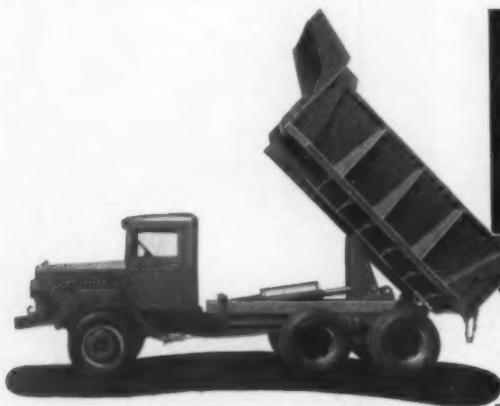
"The points that were made by Dr. Albrecht and Mr. Finn illustrate the thinking that we in O.P.A. did when in May, 1943, we issued M.P.R. 386. At that time we found that a substantial number of producers were suffering hardship. Many of them were selling at prices that had been established by competitive bid months and even years before O.P.A. froze prices at March, 1942, levels. Labor costs were rising rapidly as were some other items of production costs.

Historically, the industry has operated on small margins which would not permit the absorption of these increased costs. So it became apparent that a substantial fraction of the industry needed relief or it would have to cease operations.

"Our first effort at giving relief was applicable only to sales to A.A.A. and not to sales to commercial or private purchasers. This, of course, resulted in the paradox of some producers having a higher legal ceiling on government sales than on sales to farmers, truckers or dealers. When we issued M.P.R. 386 we corrected the defect I just mentioned and gave the industry a regulation which was



Tons of all liming materials reported used on soils in the United States from 1929 to 1943 as reported by the War Food Administration. 1944 trend indicated by broken line



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HERCULES STEEL PRODUCTS COMPANY GALTON, OHIO

tailor-made to fit it. That regulation worked very well but it needed clarifying and refining, as we learned after administering it for about 1½ years. So on October 7, 1944, O.P.A. issued a revision which is the price regulation now in effect.

"Revised M.P.R. 386 has all the essential features of its predecessor plus a few new ones. Section 10 still gives a producer the choice of three ways to establish his bulk, f.o.b. plant ceiling price. Under Rule 1 he may retain the highest f.o.b. plant price that he charged each class of purchaser during March or April, 1942. Rule 2 permits him to continue the price at which he contracted with A.A.A. between September 12, 1942, and May 15, 1943, and it further provides that he may extend the price increase he got on sales to A.A.A., to other classes of purchasers. And Rule 3 provides a formula whereby a producer may compute a new maximum price by adding to his base period price his increase in production cost.

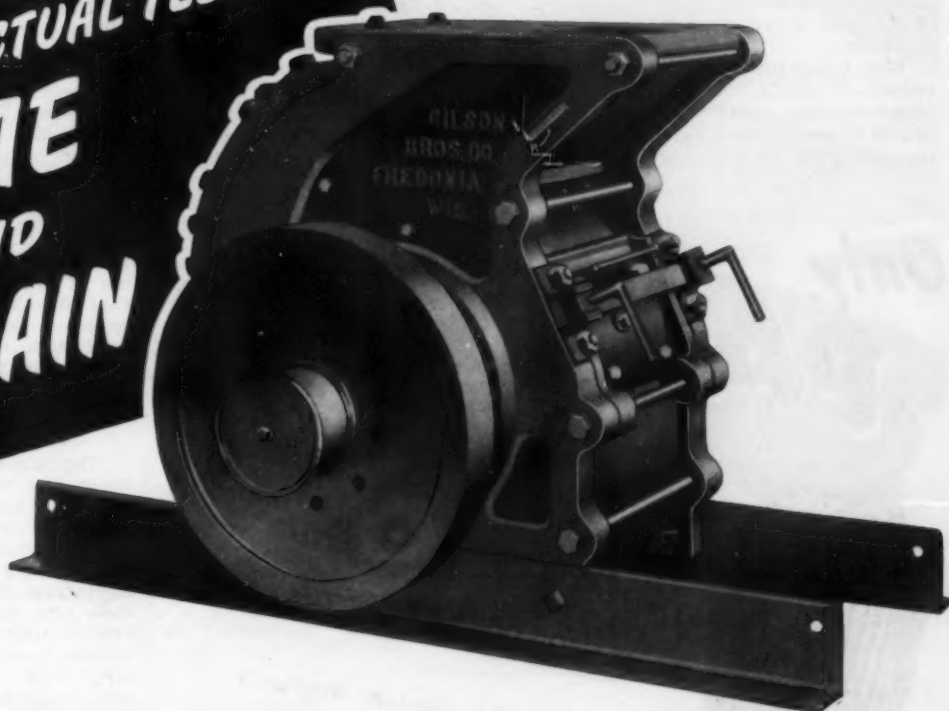
"Rule 3 has been rewritten and is, we think, easier to understand. The establishment of a new price is broken down into 4 steps:

"Step 1 is to compute the cost per ton to produce agricultural liming material during the base period which for most producers, is the year 1941. This is done by adding all items of production cost for the year and dividing that sum by the tons produced. Where a producer cannot separate liming material cost from his cost of making other products he may base the computation on the entire output of his plant of all products. Also, where a producer operates more than one plant he may figure each one separately or combine data into a single computation.

"Step 2 is exactly the same computation as Step 1 but covers the six-month period ending April 30, 1943.

(Continued on page 104)

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BY ACTUAL TEST  
TIME  
AND  
AGAIN**



**T**HERE have been success stories aplenty among agstone producers in the last few years. That is bound to occur when commodity demand multiplies as rapidly as it has for agricultural limestone. And a good share of these outstanding successes have built their business on a product turned out by Gilson Limestone Pulverizers.

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## A.A.A. Policies

(Continued from page 102)

"Step 3 consists of subtracting the figure obtained in Step 1 from the figure obtained in Step 2. The difference is added to the base period price to each class of purchaser. However, the amount added may not exceed 30 cents per ton or 15 percent of the base period price, whichever is greater.

"Step 4 is to mail all these computations to O.P.A. at Washington. Upon receiving them we check the figures to see that they conform with the regulation and, if they do, we

mail a postal card to the producer which informs him that his price has been received and filed. If there is something wrong about his computation we inform him of it by letter.

### Where Agstone Becomes Main Product

"During the spring and summer of 1943 we were finding that Rule 3 did not fully meet the requirements of the industry. It was during that period that the crushed stone business was dropping off and with it the tonnage of agricultural limestone which in many cases was produced

as a co-product. The only way that these producers could maintain their output of agstone was to make it as a primary product. This involved increased costs which O.P.A. was willing to recognize, but which could not be brought to light under the provisions of Rule 3. So Section 8(b) was written into the regulation.

"This new section permits the Administrator to adjust the maximum price for a producer of agricultural liming material when he shows in an application for adjustment that (1) there exists a shortage of supply, (2) his maximum price will not permit him to continue production without substantial hardship, (3) the loss of his production would force purchasers to resort to higher priced sources of supply, and (4) Rule 3 will not give him the required measure of relief. The amount of relief that may be given under this new section is limited to the increase in production cost between the base period (1941 for most producers) and the most recent 3-month period preceding the application.

### Portable Operations

"The only other change of importance that was made when M.P.R. 386 was revised applies to operators of portable equipment. We found that a few operators with high ceilings were moving around within states and across state lines and carrying their high ceilings into areas where existing ceilings were low. This was causing trouble for both O.P.A. and A.A.A. Now, under Section 13 a portable operator may take his ceiling with him provided there is no other portable operator with a lower ceiling price in the area into which he is moving. In the event that there is a lower ceiling in that area the producer who is moving in may not exceed it.

### New Production Encouraged

"It also is of interest to note that under price control 83 new producers have started in business. At least they have filed prices with us and we assume they have started in business. Operators who cease production are not required to notify O.P.A. so we have no record of how many dropped out.

"Another phase of this question we must answer is: Has the regulation kept prices at a reasonable level? Here, again, I must use a few figures and what I have to say refers to f.o.b. plant prices, only. We know that there are about 1,000 producers of liming materials in the U. S. Of this number 257 have obtained price adjustments under M.P.R. 386, averaging around 23 cents per ton. Also, prior to the regulation, 145 producers obtained price increases averaging 21 cents per ton on sales to A.A.A., which they have been permitted to keep. Thus, we have a record of 402 price adjustments, averaging about 22 cents per ton each. Therefore, it is

(Continued on page 106)

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The RED-STRAND in "HERCULES" Wire Rope is only paint deep. But what it stands for penetrates through and through, as it represents long experience, diligent research, and advanced manufacturing methods—all of which add up to top-flight service.

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Sleek, powerful and modern are the Streamliners as they go streaking through the country on fast schedules and with heavy loads. Their rugged Diesel engines take terrific punishment and take it ably.

Yet there is a spot in these sturdy engines that is vulnerable to wear . . . the cylinder liners. Or rather, the liners are vulnerable to wear *unless they are long life liners treated with PORUS-KROME* . . . as many Diesel engine liners are.

That is why one large manufacturer of Diesel engines for Streamliners and other applications has standardized on PORUS-KROME liners for all engines coming off the production line. And that is why other engine manufacturers are planning to use PORUS-KROME in their engines as soon as they can again build engines for civilian use. It enables them to

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PORUS-KROME is hard, pure chromium which is applied to cylinder bores by the patented Van der Horst process. It has tiny pores and channels in its surface which serve as reservoirs for lubricating oil, feeding it back to the surface as needed. It reduces corrosion and wear and multiplies cylinder life 4 to 20 times, and ring life 3 to 4 times.

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AN AFFILIATE OF DRESSER INDUSTRIES

ROCK PRODUCTS, April, 1945

105

reasonably accurate to say that around 40 percent of the industry representing half of the tonnage has needed and obtained relief since the inception of O.P.A. The other half of the tonnage is being sold at March, 1942, ceilings which, in most cases was the 1941 price. Thus, for the industry as a whole we may say with considerable accuracy that today's f.o.b. plant prices are between 10 and 12 percent higher than they were in 1941.

"It might be of interest to examine this subject a little further. Agricultural liming materials is one of a large group of commodities that enter into the computation of parity prices of farm products. The weight of liming material prices in that

computation is small, almost negligible. To illustrate, in 1943 farmers spent about \$425,000,000 on fertilizers and lime. Of this about \$55,000,000 represented liming material purchased. That same year the total cash farm income was \$21,207,000,000. Therefore, the cost of liming materials was equivalent to 2.6 mills out of each \$1.00 of gross farm income.

### Conservation Program

(Continued from page 94)

show a decided increase in spite of production and distribution handicaps brought about by the war. If it should be assumed that the liming materials which moved without re-

gard to A.A.A. contracts were the same as in 1943, then the total tonnage for 1944 would be nearly 23,000,000 tons.

Comparison of this estimated total tonnage for 1944 with the requirements shown in the last column of the table indicates the ground that is still to be covered—by research, education, and government financial assistance. It can't be done overnight—or even, perhaps, in a few years. It will take concerted action on the part of farmers, the trade, and government.

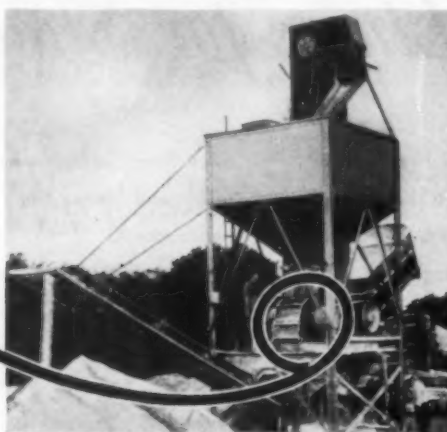
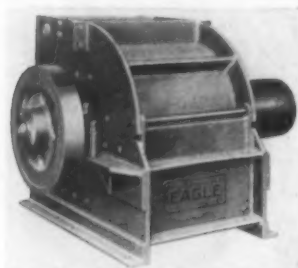
The responsibility of A.A.A. in helping to attain this goal will continue to be discharged as long as Congress authorizes the agricultural conservation program. New experience, accruing from each year's operations, leads to improvements in method. A.A.A. will constantly undertake to employ the best means of attaining the objective. A.A.A. contracts have served to stabilize distribution and spread it over all twelve months of the year. Production has thus been supported and the development of new limestone deposits facilitated. This has been an asset to both producers and consumers of liming materials. However, it may well be that an aggressive financing scheme by the trade could obviate the necessity for government contracting. The way will continue to be open for complete distribution through "regular trade channels" without participation by the government.

### Trend to Purchase Order Plan

As conditions permit, there will no doubt be shifting away from contracting into use of the purchase order plan. Substantial progress has already been made in converting to purchase orders for the procurement of seeds and superphosphate. The primary purpose of this change is to utilize the services of local dealers and handlers in the physical transference of materials to farmers. Unless a material is subject to such local handling, no particular advantage would be gained by using purchase orders. As each individual purchase order is a contract between vendor and government, the mere substitution of one type of contract for another might accomplish nothing. Where bulk liming materials are involved, it is not yet clear to what extent advantage will accrue in converting to the purchase order plan—unless, of course, established truckers can function as dealers. Neither is it certain what the situation will be after the war, when more active trucking competition returns.

Regardless of the plan of operation, the very fact that farmers are given financial assistance in carrying out conservation practices involving the use of materials means that assistance also is given toward production of the materials. In this respect

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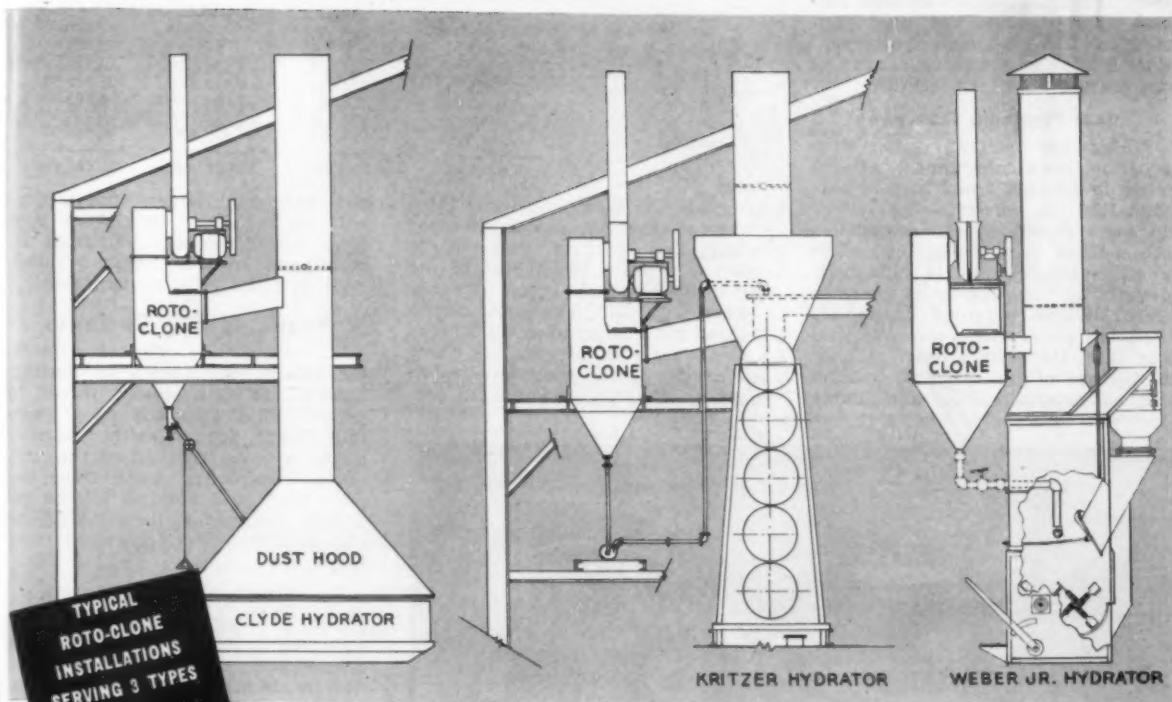
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# ROTO-CLONE

FOR ROCK PRODUCT DUST CONTROL





there is a close parallel between federal appropriations for road construction and those for soil conservation, insofar as the manufacturer of the crushed stone is concerned.

### How Program Operates

Under the current conservation program, cash collections are being made in advance from farmers participating in materials practices. In some States, county committees are making these collections, while in others the collection is being made directly by the supplier of the material. Where purchase orders are used, the dealer makes the collection. For 1945, the farmer bears at least 20 percent of the delivered-to-farm cost of superphosphate and liming

### AGRICULTURAL LIMING MATERIALS—TONS

Region	Total Distribution 1943	AAA Contracts 1943	AAA Contracts 1944	Annual Need
Northeast .....	2,034,082	1,189,119	1,916,686	4,723,205
North Central .....	12,100,072	6,190,072	6,413,883	25,139,985
East Central .....	3,834,278	2,385,300	3,054,513	9,305,628
Southern .....	745,023	433,606	2,240,768	10,742,589
Western .....	163,145	148,553	457,100	1,468,787
<b>TOTAL .....</b>	<b>18,876,600</b>	<b>10,346,650</b>	<b>14,082,950</b>	<b>51,380,194</b>

materials. As farmers become more and more accustomed to carrying out conservation practices, they will be asked to share a larger part of the cost of the material.

There is much to be done in the field of soil conservation. It will be a great task even to repair the damage caused by the successive record breaking harvests required to win

the war. Still larger undertakings will be necessary to correct long term basic deficiencies. But from the standpoint of our nation's future nothing could be more important.

### Agstone Is Big Business

(Continued from page 84)

the smaller one has 1/4-in. spacing. Tramp iron is a serious threat to production, particularly so at high mill speeds, so a Stearns magnetic pulley is being installed on the conveyor transporting stone from the main plant and another will be installed, probably at the head of the elevator filling the pulverizer feed bins.

### Valmeyer Plant

The arrangement for producing agricultural limestone at Valmeyer is considerably different but just as flexible. Plant capacity is 150 t.p.h. here and all the stone is mined. Operations started at Valmeyer in 1918, 12 years after the Krause operation began, and mining was started in 1925. Stone products test as high as 99.8 percent CaCO<sub>3</sub> and the principal outlets are for metallurgical and chemical use.

Location of the plant with respect to the terrain and the mine entries has been taken into consideration at this plant, the mine openings being some 30 ft. higher than the plant level. An intermediate gravity-fed surge storage pile, between the main mine entrance and the plant, with a 36-in. tunnel belt conveyor is the source of feed to the plant. The primary crusher, a 15N Allis-Chalmers gyratory, is located at the mine entrance flush with the mine floor for direct dumping of trucks.

Until 1943, all stone crushed to 6-in. top size was placed in the surge

(Continued on page 110)



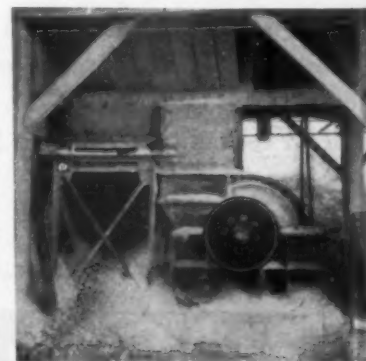
## CINCINNATI CONVEYOR BELTS PLAY A TRIPLE WAR ROLE

This aggregate plant produces three war products . . .

- ★ LIMESTONE for enriching soil.
- ★ LIMESTONE FLUX for steel mills.
- ★ AGGREGATE for railroad ballast and highway construction and repair.

Cincinnati Conveyor Belts are depended upon in this big, modern plant to carry all three products without delay or interruption, day in day out . . . in huge quantities . . . at a low belt cost per ton. Cincinnati Conveyor belts really deliver the goods.

**CINCINNATI**  
**RUBBER MANUFACTURING CO.**  
Cincinnati, Ohio



Close-up of pan conveyor fed ring crusher which produces considerable agstone at the Valmeyer plant

# You won't find GENERAL EXCAVATOR listed in the Mortality Tables!



**EVERY GENERAL BUILT SINCE 1927, ON WHICH THERE IS A RECORD, IS STILL AT WORK!**

**It's a fact!** Every General Excavator built during the past 18 years, on which we are able to check, is still in action: doing a good day's work every day. Our records cover 98% of all Generals

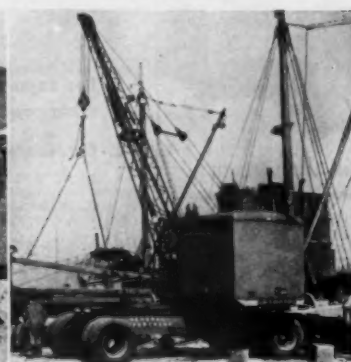
manufactured; the other machines are those sold by their original owners and on which we do not have recent information.

That's the kind of a performance record that has built confidence in General Excavators and Super-cranes . . . confidence that will mean even more Generals at work during the postwar era. Include General in *your* postwar equipment plans! Get all the facts about the complete General line and be sure to inquire about the revolutionary new . . .

## GENERAL TYPE 10

Combination Crane, Shovel, Dragline and Backhoe—One Man Controlled—One Engine Operated—On Rubber Tires

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THE  
**OSGOOD**  
COMPANY  
SHOVELS, DRAGLINES  
CRANES  
CRAWLER & WHEEL MOUNTS  
DIESEL, OIL, GAS, ELECTRIC

Associated with The Osgood Company  
**GENERAL**  
EXCAVATOR CO.  
MARION, OHIO



CRANES, DRAGLINES  
AND SHOVELS

(Continued from page 108)

storage pile by a 30-in. belt conveyor but the fines contained handicapped the effectiveness of the surge pile. Due to a tendency to hang up vertically in drawing stone from the surge pile, the presence of the fines actually cut the live reclaimable storage capacity from 1300 tons to almost half that figure.

An intermediate installation was made adjacent to the mine entrance to screen out agstone (10 percent of total) in order to correct this condition and to relieve the screening load in the main plant. It consists of a 36-in. inclined belt conveyor from the primary crusher to a 4- x 10-ft. Stephens-Adamson double-deck vibrating screen and the installation of

a second stacking conveyor, 140-ft. centers, for stockpiling agstone. The top deck of the screen merely protects the 4-mesh cloth on the lower deck.

As this is written, to supplement the production of agricultural limestone in the main plant and that screened at the mine, a 30 x 40 pulverizer is being installed between the two stacking conveyors. It will be fed from a 20-ton bin by a General pan conveyor and discharge direct to stockpile. The scalping screen will have a top deck with 1-in. sq. screen openings and the minus 1-in. stone retained on the lower deck will be conveyed by belt to the pulverizer bin.

In the main plant, various products are screened, with some re-crushing, principally flux stone, and agstone is screened through two tandem 4- x 7-ft. Tyler Hummer screens carrying 4-mesh heavy wire cloth. The arrangement for handling the agstone is flexible. It may be loaded directly into railroad cars, carried to stockpile or placed in a truck-loading bin. Much of the fines screened out are a product of a ring pulverizer which produces a high percentage of fines as a reduction crusher. This pulverizer is in closed circuit with the screens by bucket elevator.

Stone retained on the Hummers becomes the feed for a 5-roll Raymond high-side mill for the fine grinding or is diverted into a bin from which it is fed by a pan conveyor to a 30 x 40 pulverizer which has 1/4-in. grate spacings and produces agstone either in open or closed circuit. Its discharge may be elevated for screening or be conveyed to a new 150-ton steel bin for loading trucks or railroad cars.

Thus, cars may be loaded direct from the agstone screens or from either of two bins or by locomotive cranes from either of two stockpiles. Trucks may be loaded from the same sources. Stockpiled agstone, which at times accumulates to as much as 300,000 tons, is handled in stockpiles by an International TP18 tractor with a 12-ft. Bucyrus-Erie bull-dozer blade. Separate platform scales weigh trucks and railroad cars.

At Prairie du Rocher, four hammer pulverizers are in service but the production of agricultural limestone is small by comparison with the Krause and Valmeyer plants. Much of the tonnage is produced for chemical use.

E. J. Krause is president of the Columbia Quarry Co.; W. E. Schmidt is vice-president and treasurer; H. C. Krause is vice-president of sales; A. J. Elliott is secretary and assistant treasurer; and C. H. Krause II is purchasing agent. E. A. Heise is superintendent at Krause, Fred A. Krewer at Valmeyer and Joseph Christopher at Prairie du Rocher.

### All-Diesel Dredge

(Continued from page 74)

The gravel pump with 12-in. intake and 10-in. discharge is driven directly by the main Diesel, an all-enclosed, 8-cylinder unit of 9-in. bore and 10-in. stroke. In two of the pontoons there are sections that serve as fuel storage tanks, each with a capacity of 2400 gal. A motor-driven rotary pump transfers the Diesel fuel to an overhead day tank from which it flows through duplex filters to the engine. The quantity of fuel injected into the cylinders is regulated to meet the varying load by a centrifugal-type governor.

Good lubrication is recognized as

(Continued on page 112)

## Use *Genuine* WILFLEY TABLES for WET GRAVITY CONCENTRATION

\*TO SAVE NON-METALLIC MINERALS



*Which One*

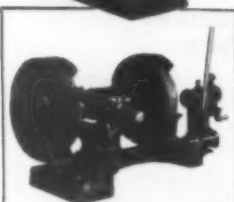
### OF THESE FOUR USES FITS YOUR NEED?

1. Before or after flotation for recovery of coarse mineral not readily susceptible to flotation.
2. For separations (or grading up) from previous table concentration or from original table feed.
- \*3. For concentrating low grade feeds to produce high grade concentrate for chemical treatment and tailings.
4. For concentrating a middlings feed producing a high grade concentrate and a middlings for re-grinding.

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Marcy Ball, Rod & Tube Mills; Rock Bit Grinders & Hot Mills; Pinch Valves; Belt Feeders; Density Controllers; LABORATORY EQUIPMENT & SUPPLIES; MINE & MILL SUPPLIES; COMPLETE MILLING PLANTS.



**MASSCO JUNIOR  
Rock Bit Grinder**

For the user of a limited number of bits—either detachable or conventional steel. Sold as shown, or, fixtures only for face and gauge grinding with independent bases—usable with any grinder (bit holder included).



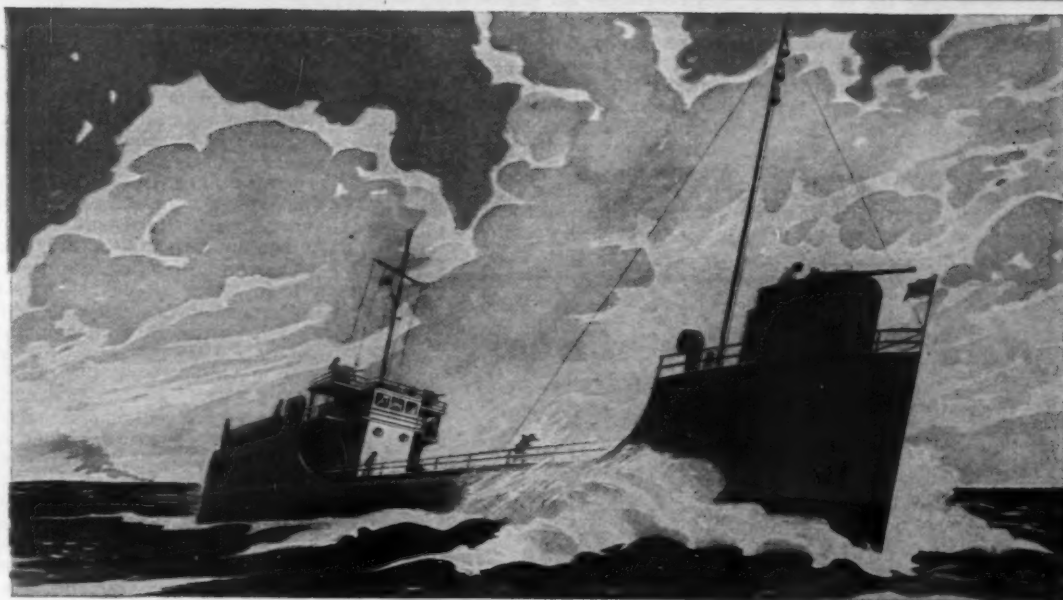
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NEW YORK CITY

The  
**Mine & Smelter**  
Supply Co.

CANADIAN  
VICKERS, LTD.  
MONTREAL  
W. R. JUDSON  
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# Odenbach



## BUILDERS OF ALL-WELDED STEEL SHIPS

Odenbach maintains one of the largest "all-enclosed" shipyards in the world which makes year 'round production possible with the ability to meet definite delivery dates. Shipyards located in Rochester, N. Y. and Miami Beach, Florida, have complete facilities for designing and building both standard and "special" types of craft including: TANKERS, SELF-UNLOADING CARGO SHIPS, HOPPER and DECK BARGES, TUGS, DREDGES, SCOWS and other types of HEAVY MARINE EQUIPMENT.

(SPECIALISTS IN BUILDING BARGE SECTIONS ADAPTED TO RAIL TRANSPORTATION  
& AND ASSEMBLY AT DESTINATION

Write for Information Regarding Designs, Shipbuilding, and Conversions

## ODENBACH HOLDING CORPORATION

ROCHESTER 4, N. Y.

the first essential and precautions are taken to keep the oil in good condition. The engine is served by a pressure circulating system supplied by a built-in gear pump. This system includes a filter and an oil cooler. In the first months of operation, it was the practice to change the oil every 200 hours. An activated clay purifier was then installed for continuous service and the necessity of changing oil will be less frequent. Carrying forward this program of engine protection, the engineers provided a closed cooling system. Only soft water is allowed to enter the engine jackets and this is circulated by a built-in, centrifugal pump driven off the cam shaft. A heat exchanger was built

into the hull. Raw water is drawn through a screen from the surrounding pond and put through the heat exchanger by a centrifugal pump V-belted to the engine crankshaft.

A further protection is supplied by an oil-bath air filter mounted on the engine frame. All engine air passes through this filter before entering the intake header. The filter also serves as an intake silencer. Exhaust gases vent directly through a vertical snubber. An exhaust pyrometer, pressure gauges and thermometers are grouped conveniently so that the operator may learn in a moment the condition of fuel, cooling water and lubricating systems and the exhaust temperature at each cylinder. As a final

precaution, the engineers installed a safety control which stops the engine automatically if jacket water gets too hot or lubricating oil pressure drops too low.

#### Diesel-Electric Drive

The hoist that handles the big suction line is motor-driven and electric power for the purpose is supplied by a 220-volt generator V-belted to a 60-hp. Cummins Diesel. This auxiliary engine is mounted on a hollow steel base and the generator is set within this housing. This arrangement conserves space and keeps the generator out of the workman's way. The same engine drives, through a clutch, a centrifugal priming pump of 4-in. intake and 3-in. discharge.

The third Diesel on the dredge is a 12-in. Lister which performs several miscellaneous but vital duties. First it drives, through a clutch, a two-stage air compressor which supplies air for starting the main engine and for the air signal whistle. A rotary pump driven through V-belts can be used for either bilge pumping or priming. Finally, the engine drives, by V-belts, a 110-volt generator placed in the steel housing under the engine. Both the auxiliary units are equipped with radiators for cooling, fuel and lube filters, air filters and exhaust snubbers.

In purchasing a dredge for its Bluff Creek operations, Jahncke Service was interested in three things; high output, continuous performance and low power costs. With its original installation all three of the above requirements have been met and Jahncke officials are satisfied with the fact that the Bluff Creek dredge is delivering the goods and that Diesels for dredging are a profitable investment.

#### Magnesium Readjustment

C. C. LOOMIS, president of the New England Lime Co., recently testified before the United States Senate Small Business Committee in which he proposed that the government keep alive those magnesium units using the Pidgeon process through the period of readjustment after the war through a rental arrangement with rental rate based on earnings. Mr. Loomis also recommended development of peace-time use of cast and fabricated magnesium beyond the point where the metal can be supplied as a by-product of the chemical industry. He further urged that ferro-silicon, or some substitute reducing agent, be made obtainable at a lower cost than the present price, and that some technological improvements be made in the Pidgeon process.

#### Plant Addition

UVALDE ROCK ASPHALT CO., Houston, Texas, is receiving bids for the construction of a one-story addition to its plant on Oliver street.

**Here's an example of what**

## "ORO SUPERMANG" "QUAD-EDGE"

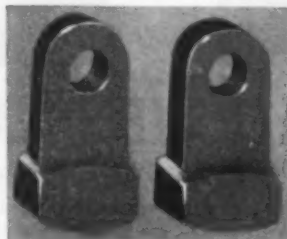
**REVERSIBLE AND RENEWABLE  
TIP HAMMERS CAN DO FOR YOU!**



The hammers shown here are typical of the savings you can make with "Quad-Edge" Four Corner Reversible and Renewable Tip Hammers. In addition to improved design, the ORO Supermang manganese steel used gives the parts longer-lasting wearing service. Write for Bulletin 451 which describes all the advantages of using "Quad-Edge."

"Quad-Edge"—a 20-lb. Hammer with 7-lb. "Quad-Edge" Reversible Four Corner Tips. When replacements are necessary, you buy a 7-lb. tip which because of its reversible features gives the approximate service of two 20-lb. Hammers.

Use ORO Supermang Repairs for Crushers, Pulverizers, Shovels, Cranes, Draglines, Feeders and Chains. Write today for literature of ORO Super-Service Repair Parts.



"Conventional" hammers. Two of these are needed to do the work of one "Quad-Edge" because of the latter's reversible features. Customers report that "Quad-Edge" Tips cost them about one-half of previous welding costs.

**KENSINGTON STEEL CO.**  
507 KENSINGTON AVE. CHICAGO 28, ILL.

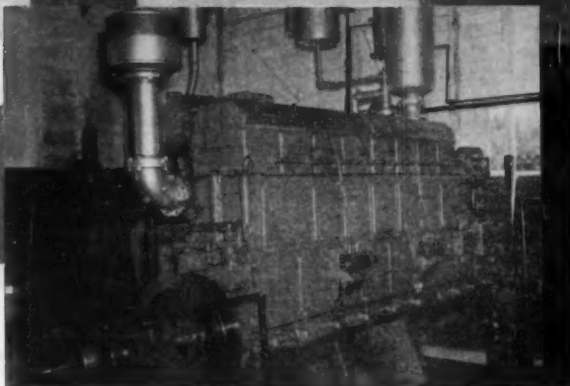
**UP WITH SAND  
AND GRAVEL...**

**DOWN WITH  
COSTS!**

\$20.00 saved daily—a good example of what a well-chosen diesel offers in dredging operations aimed at high output, continuous performance and low power costs.

After careful consideration, the Cooper-Bessemer multi-speed diesel shown at right was selected for continuous year-around service at the Bluff Creek location of the Flint Sand and Gravel Company, subsidiary of Jahncke Service, Inc., New Orleans. Compared with their other operations, electric powered, they have reduced operating costs by \$20.00 daily while averaging 28 cars of gravel and sand per day through a 470 ft. pipeline. The Bluff Creek dredge is doing a real job and company officials are convinced that diesels for dredging are a decidedly profitable investment.

Efficient, reliable Cooper-Bessemer diesels, ranging from 50 to 2000 hp are giving outstanding serv-



This variable-speed, 8 cylinder Cooper-Bessemer diesel, rated 230 hp at 350 rpm and direct-connected by flexible coupling to a centrifugal counterflow gravel pump, has established a notable record of efficient and economical performance in Flint Sand and Gravel Company's dredge at Bluff Creek.

ice in many types of prime mover installations. The nearest Cooper-Bessemer office will gladly give you complete information on the proper diesels for your particular power requirements.



New York   Washington   San Francisco, Calif.   Seattle, Wash.  
Houston   Dallas   Tulsa   Shreveport   St. Louis   Los Angeles

**BUILDERS OF DEPENDABLE ENGINES FOR 112 YEARS**



## Promoting Agstone

(Continued from page 76)

through the A.A.A. Personally, as a general policy, I am opposed to government subsidies. I feel that the farmers should be helped but not supported. However, as long as the pork barrel seems to be bottomless, each group of our American life feels it proper to get its share. It is my opinion the government should help finance the farmers so they can help themselves, in the same manner the home owners were helped to finance the building and purchasing of homes. It is my understanding the government lost very little money under this plan. Our company has

stored agricultural limestone for 15 years and still has a large reserve, and for this reason we have not found it necessary to increase our productive capacity.

"When the federal government began giving away agricultural limestone, the various local groups naturally were interested in purchasing it from their friends in the states or localities involved. As a rule these friends frequently did not have money for the construction of a new plant and had to go to the government to get money to build plants to sell the government agricultural limestone, and in many cases the government itself through the States has built agricultural limestone producing

plants, which in time will become competitive stone producing plants.

"Summing up, we are dead against the entire procedure and the sooner the government takes its hands out of the business the better off we will all be. However, as long as there is an A.A.A. market for agricultural limestone we are, naturally, going to try to sell what we can. It is my belief when the pendulum swings back, if it ever does, all such projects will automatically cease and then it will be necessary for the insurance companies, banks and others, who have been responsible for the lack of improvement in farming, to take over the job as there will be literally hundreds of small agricultural limestone producing plants, whose only use is for the bats, as has been the case where many blue sky units of industries have been built in the past."

One of Pennsylvania's biggest producers of limestone and lime remarked, "We are not tremendously concerned or disturbed about the reduction in A.A.A. funds which will be made available for agricultural limestone payments. While we think the government has done a splendid job in this connection, we feel that the average farmer has become more lime-minded and conscious of the necessity of using the proper amount of lime or limestone for his soil. We do not plan any more definite action to off-set this anticipated reduction other than the usual intensive sales efforts and promotion which we have been using in the past."

### Efficient Distribution

From Oklahoma, where the application of agricultural limestone to the soil is a recent practice, one of the most progressive producers wrote as follows:

"The method of operation in 1944 was to obtain all of the tonnage available in every county and then work this tonnage intensely with a large distribution set up. We have now changed our method and have doubled the number of distributors working from our plant. We have 12 counties which are adjacent to our plant which we formerly worked with the two distributors. We now have four distributors and are planning on additional distributors to take care of the 12 counties. Each distributor has his own sales promotion men whom we help pay in order to get the production increased. We do not contemplate any distributor changes. We feel that a concentrated effort to get limestone spread cannot be done except through a good distributor. We have adequate delivery and spreading equipment and can do a much better job than an individual farmer or a cooperative system which might be set up among several farmers.

"We do feel that the reduction in A.A.A. funds will have a serious effect both now and in the future on

(Continued on page 116)

## Make Your Initial Reduction in a ROGERS JAW CRUSHER

**T**HE progressive agricultural limestone producer is the one who first reduces his quarried stone in a Jaw Crusher. And you can be sure of maximum reduction efficiency with a Rogers Jaw Crusher.

Each Rogers crusher is individually designed and correctly proportioned. Bearing sizes used are from two to three sizes larger than normally used. Shaft diameters are correspondingly oversize. Other parts are made of the best materials available, which contributes toward the durability and reliability of Rogers Jaw Crushers.

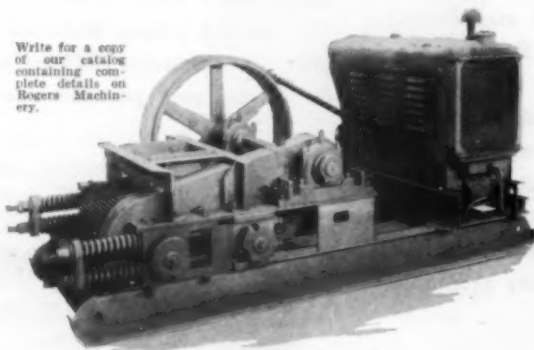
The 15" x 36" Anti-Friction Bearing Jaw Crusher shown here is typical of the high rate of reduction to be had in Rogers Jaw Crushers. It produces from 74 tons per hr. of 2½" stone to 160 tons per hr. of 6" stone on 60 to 75 hp.



15" x 36" JA CRUSHER  
(ROLLER BEARING)

### ROGERS CRUSHING ROLLS

Backed by years of experience in roll building, they have advanced in size and design to meet the needs of modern demands for increased production with lower costs. Shown here is the spaced type, roller bearing, chain driven skid machine, mounted with its power unit.



Write for a copy of our catalog containing complete details on Rogers Machinery.

QUARRY PLANTS

GRAVEL PLANTS

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STEEL BINS

**ROGERS IRON WORKS CO.**

JOPLIN, MISSOURI

Looks like wheat,  
but they tell me  
it's **Rubber!**



It *IS* WHEAT . . . but in 1944, nearly 150 million bushels of wheat produced the alcohol used in making 400,000 tons of synthetic rubber.

But this is just *one* of the interesting facts about synthetic rubber. Another is the well-defined superiority that some synthetic rubber has over natural rubber for many uses.

Hewitt has had long experience with synthetic rubber. In fact, *14 years* ago, Hewitt engineers developed the first synthetic rubber gasoline hose. It lasted *ten times* longer than natural rubber gasoline hose.

Hewitt progress in the development of synthetic rubber products has never ceased. And today Hewitt is convinced that certain synthetics are *here to stay* . . . no matter when or how much natural rubber is available.

So, for today's belt and hose requirements, buy with confidence and satisfaction from men who know "synthetics."

Specify "Hewitt" for synthetic rubber quality at its best. Phone the Hewitt distributor listed in the Classified Section of your telephone directory . . . or write Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, New York.

**HEWITT RUBBER** *of Buffalo*  
Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 85 YEARS

## Promoting Agstone

(Continued from page 114)

the distribution of agricultural limestone in Oklahoma. This is a new State as far as agstone is concerned and we do not have the background of successful operation of farms using agstone to show other farm managers the value of agstone. We hope through intensive sales work to get the product distributed to good farms and then use these farms as "guinea pigs" to show other farmers its value. We feel that the distribution is better through our own set up and we feel that the reduction in A.A.A. funds will make this even more necessary. The reduction in A.A.A.

funds will cause low grade materials to be forced off the market as the farm managers will want to buy a quality product. We do feel, however, that there will be reduction in the potential tonnage both now and in the future.

"The potential production in Oklahoma has been increased by about ten times what it was 18 months ago and the problem now is not the manufacture of agstone but the sale and distribution. The sale, however, is most important inasmuch as the farmer must pay an increase in amount each year under the program. In order to level out our production during the entire year we are encouraging farmers to spread one

field and one pasture each year. We will spread the field which will be planted to corn, cotton, etc., in the time of year before and after the crop and then spread the pastures during the winter and during the summer. This method may serve to let our plant work on a level basis."

A New England producer wrote as follows, "I think producers are particularly disturbed about the reduction in A.A.A. funds which would be available for agricultural limestone payments because one thing the A.A.A. has done which has been of great assistance to the manufacturers is to considerably increase tonnage to meet the soil requirements; and, second and even more important, it has been able to so distribute the load of deliveries over 12 months of the year that it has fitted into the manufacturing schedule of the producers.

### Economical Distribution

"From the standpoint of deliveries, more economical distribution has been effected by the delivery of material in carload lots on accumulative areas to farmers utilizing the facilities of the local A.A.A. organizations to build up these carload shipments. This applies to areas located beyond 50 miles from the producing plant; in areas shorter than a 50-mile haul, truck load delivery directly to the farm seems to be more desirable and more economical from the standpoint of total overall cost to the government.

"During the past few years, there has been a very substantial increase in the production of agricultural limestone and manufacturers have given themselves to the study of production, which has resulted in the mechanization of quarries, installation of machinery, and very effective methods of delivery. However, if sales were handled in the old way by sale through the dealers, I am convinced we would go back to the old way of peak sales in the Spring with practically no distribution during the Summer, a slight increase in the Fall and no distribution during the Winter, which would substantially increase the cost of production and distribution of limestone."

The following is from one of the larger producers, affiliated with The Processed Limestone Association, Inc., in Ohio which has been accomplishing much in the direction of getting farmers to apply agricultural limestone over more than the peak months:

"We have been producers of agricultural limestone for a number of years and have marketed our products through dealers. Since A.A.A. started we have continued our advertising program as in the past and have increased our number of dealers. We expect to continue our program, spending about the same amount of money for advertising and promotional work. Should there be a

(Continued on page 118)

## GRUENDLER CRAFTSMANSHIP SERVING INDUSTRY 60 YEARS



Partial Shipment of Gruendler Portable Crushers

# 1500 Units

## TO THE ARMY AND NAVY...

That is why we haven't been able to do very much for our friends in civilian clothes.

Carload after carload has gone out from GRUENDLER to all parts of the world.

Working for the Army and Navy has been a great experience—and a good one too. We have learned a lot of things that are going to make GRUENDLER CRUSHERS do a better job in a better way than ever before.

Some units have now been released and are in production. Write for data and delivery dates.—The unit you want may be available.



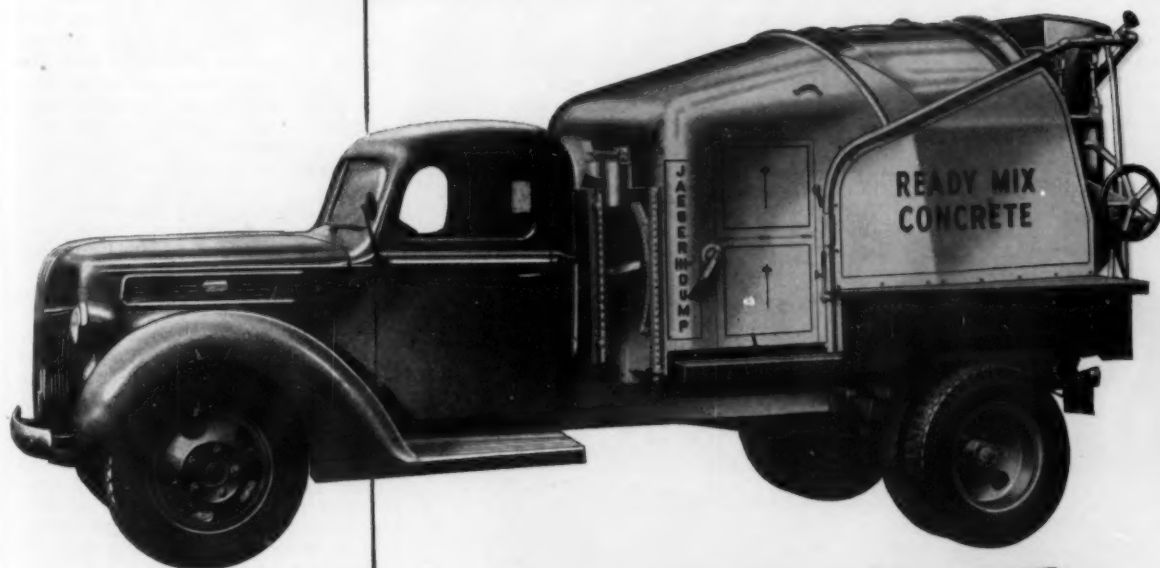
# GRUENDLER

CRUSHER and PULVERIZER CO. • ST. LOUIS 6, MISSOURI



You're looking at

## YOUR NEXT TRUCK MIXER



### JAEGER 1945 MODEL "HI-DUMP"

*New Speed of Charging and Discharging Thru Gated Hopper Always Sealed to Drum*

*Positively Aligned Center Transmission and Drive*

*Faster Water Distribution Under Pressure*

*Over-All Housing Gives More Protection, Quicker Access to Clutch, Engine and Transmission*

*Outside Slump Meter Shows Approximate Slump Without Stopping or Opening Drum*

*Many Other Improvements, plus the Exclusive Jaeger "DUAL MIX" Action*

the "speed merchant" that will sell another 50,000,000 yards of concrete to America

Have you talked to your Jaeger distributor about what's ahead for "ready mixed"—not only the all-time, all-high demand for concrete that will break loose tomorrow but many important needs that must be served this year, including the new multi-million dollar farm improvement market?

You'll find him fully informed and ready to supply customers according to essentiality with Jaeger Truck Mixers that are as far in advance of former models as "Tomorrow" is ahead of "Yesterday."

*(Jaeger 1945 improvements are also available in "LOW CHARGE" models to match present "LOW CHARGE" fleets)*

**THE JAEGER MACHINE COMPANY**  
603 DUBLIN AVENUE, COLUMBUS 16, OHIO



CENTRIFUGAL PUMPS



AIR COMPRESSORS



HOISTS



LOADERS

reduction in A.A.A. funds, we are not anticipating a loss in sales, providing farm prices are maintained on a comparable level with other products. The A.A.A. Program has made more farmers agstone conscious and by using it the farmers have had demonstrated what it will do for them on their own farms. This will help sales of limestone in the future.

"In sections where farmers have used limestone for some years, spreading equipment is generally found. Where it has not been used in the past, spreading equipment most generally has to be supplied or the material spread for the farmer. With the shortage of farm labor there has been more demand for the last three years to have limestone spread on the field. We are encouraging our deal-

ers, located in territories where the land is suitable for spreading from trucks, to equip themselves for doing this work.

"At the present time we are installing another mill and hope to have it in production by the middle of the summer. This addition will greatly increase our present pulverizing capacity.

"The demand for agricultural limestone in our marketing area has been in the spring and fall seasons, principally April, May and September. Because of this seasonal demand we have not been able to market as much material as we could if the demand was extended over more months of the year. *If our sales could be distributed over eight or ten months we could produce 50 per-*

*cent more material with the same plant and merchandising facilities.*

"For the past three years we have been using posters and other advertising literature explaining to farmers the many advantages in applying limestone other than at planting time. The results, so far, have been encouraging but it will be necessary to continue for some time the work started to really accomplish the desired results. In 1942 The Processed Limestone Association, Inc., of Ohio, started an intensive campaign to get farmers to use their liming materials in more months of the year. Cooperating with the Association was the Agronomy Department of Ohio State University and the Ohio Agricultural Experiment Station. This program is being continued.

"Many companies have been producing and selling agricultural limestone for 25 years or more and have built up a sales organization. I think it is better for agstone producers to sell their product, rather than to have someone else do it for them. A.A.A. has done a real job because the local community committeemen have gone down the road and contacted every farmer. If we, as producers, would do the same thing, more resale work, we could approximate the results of the A.A.A."

### Pacific Lime Development

MANUFACTURE of alcohol in the Pacific Northwest is under consideration by five large companies, and one plant already has reached the planning stage. All these plants also are interested in the production of lime, presumably for use in removing water and impurities from the wood alcohol to be made from waste wood products. Muck Trucking & Construction Co., Portland, Ore., is planning the construction of an alcohol plant at Wilderville, Ore., near Grants Pass. Three companies representing eastern interests are also considering the erection of alcohol plants; one British company and a Scandinavian concern are also mentioned as interested. The Muck plant is said to involve the expenditure of \$3,000,000. Swedish interests are said to be back of this plant. Mr. Muck's family owns extensive limestone deposits estimated to contain 100,000,000 tons. Cheap Bonneville power is one of the considerations for the location of these plants.

### Build Ready Mix Plant

WILBUR SCHEIRER, general contractor of Frankfort, Ind., is building a ready mixed concrete plant. The business will be conducted under the name of Frankfort Ready-Mix Concrete Co. The plant will be located near the soy bean processing plant of Swift & Co., for which it will provide all the concrete. However, the new concrete batching plant is to be permanent, and will supply general contractors and farmers.

## STRAYER PORTABLE CONCRETE PLANTS



Make 20 to 40 yards of specification concrete per hour on the job. One-man operation and a helper to

20 to 40  
YARDS  
PER  
HR.

handle cement bags. One hour to set up. Move from job to job. Write for booklet today.

## ERIE THE COMPLETE LINE BUCKETS



Hundreds of Erie Buckets are shipped monthly for war uses. Straight line bucket production experi-

ence means better buckets for post-war and fast delivery. Investigate the complete Erie line now.

**ERIE STEEL CONSTRUCTION CO.**

ERIE, PENNSYLVANIA

*Aggre Motors • Buckets • Concrete Plants • Traveling Cranes*

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS



“..operating costs very satisfactory”

—says Wm. L. ALLEN, Miner of Plastic Fire Clay  
Laurel, Md.

TO GET your loads from where they are to where you want them, for the least money, with the utmost sureness and promptness, is the main reason why you buy trucks, isn't it?



That's the basis of Ford Truck engineering. There's a proper Ford Truck for 95 per cent of all hauling jobs. Whether your hauls are long or short, off-the-road or on the concrete, over tough grades or on the level, one of the 126 Ford Truck combinations is practically certain to fit your needs. It

will have the right kind of power and plenty of it, giving you ample engine torque over a wide range of road speeds. It will have a chassis more massive and sturdy than comparable trucks—truck-engineered for your needs.

It will have what's needed for economical operation and maintenance. It's because of Ford truck engineering that more operators use Ford Trucks than those of any other make.

Under government allocation, present production of Ford Trucks is necessarily limited as to types, equipment and quantities for essential civilian needs. See your near-by Ford Truck dealer for free counsel in obtaining official certification of your requirements.

"I now have three Ford Trucks in service, delivering Allen Plastic Fire Clay to Bethlehem Steel Plant, Sparrows Pt., Md. These trucks are doing a good job—holding up well and making their two trips a day on this forty-mile haul for the last three years. The general operating costs are very satisfactory. I like the Ford Truck because it is light in chassis weight, yet strong, allowing more payload."

—Wm. L. Allen

# FORD TRUCKS

AND COMMERCIAL CARS

TRUCK-ENGINEERED • TRUCK-BUILT • BY TRUCK MEN



## TRUE TRUCK ENGINEERING

Powerful truck engines—Six chassis types—for 95% of all hauling jobs.

### FAMOUS FORD FEATURES

- Service ease . . . engine crankcase, transmission, clutch and other chassis units readily accessible, hence—
- Low maintenance cost.
- Universal service facilities.
- Heavy-duty front axle—massive spindles—large taper roller wheel bearings.
- Extra-sturdy full-floating rear axle—pinion straddle-mounted on 3 large roller bearings—3 axle ratios available —2-speed axle optional at extra cost.
- Powerful hydraulic brakes—exceptionally large cast drums.
- Needle bearing universal joints.
- Rugged 4-speed transmission—large roller bearings.
- Shifta-Guide speedometer dial—saves fuel—saves wear.
- All-steel comfort cab —safety glass.



## Brazil's Lime Industry

(Continued from page 61)

the F. L. Smidth Co. of Copenhagen was engaged to build a modern cement plant at Sorocaba. Later still, another cement plant was acquired at Racife, State of Bahia, the two together having a capacity of 800 tons a day, which is rather considerable for South America.

Antonio Perreira Ignacio had to have assistance, which he received from an able board of directors and particularly from his two sons and son-in-law. The textile division is now headed by a son, Paulo Perreira Ignacio, while a son-in-law, Dr. Jose

Ermizio de Moraes is general manager of all of the other manifold properties. But the old man, now 70 years old, remains the president and continues to take a live interest in all of the developments.

Dr. Moraes obtained his technical education in the United States at the Colorado School of Mines. The great aim of his life is not the exploitation of Brazil but the development of Brazil, not for profit, but for profitable development of Brazilian natural resources for the good of the Brazilian State. For an example, in the matter of sale of cement, of which there is such a shortage, he is not interested merely in its sale

but also in its application in a manner conducive to the greatest amount of general good.

With the shortage of other fuels in Brazil, wood and charcoal are the logical fuel. At least 80 percent of Brazilian automobiles are operated with gas from charcoal producers, their lime plants burn wood and their locomotives burn wood, but as we ourselves well know, supplies of wood can readily become depleted. Remote sources are costly in transportation, particularly when transport means are in a still comparatively crude state. Votorantim, through its agricultural department on its immense properties, is now planting five million eucalyptus trees to assure themselves a continual supply of wood and other benefits that are derived from reforestation. The venture, of course, will prove highly profitable as one tree costs 3 cents to plant and 5 cents to take care of through the first year. After the first year it is on its own, increasing in value 5 cents every year until at the 7th it is cut, bringing in a profit of at least 25 cents per tree. That does not seem much, but multiplied by millions it is a rather neat sum. So fuel is kept from increasing in cost and is assured. Such reforestation is good economics but is not generally practiced, to the detriment of the state.

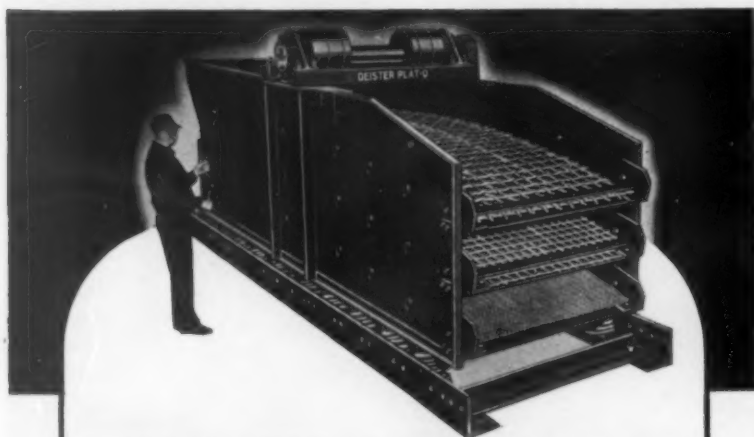
In technical charge of all the varied rock products properties is Yorgen Dalsborg, a young and able Dane of F. L. Smidth antecedents, as pleasant a sort of a person as one could find, technically very well posted, resourceful and with a most heavy burden to carry but with shoulders wide and strong enough to do it with credit.

The superintendent of the larger cement plant located at Sorocaba is Frederico Caspari. At the Sorocaba plant was also Alfred Carlson, another Dane, who labored in cement manufacture for 37 years the world over. He erected the Sorocaba plant and remained as production foreman.

The quarry of the Sorocaba plant is impressive and of course completely mechanized. The face is approximately 300 ft. high, with 92 percent  $\text{CaCO}_3$  limestone wedged in by pure dolomite extensions. The rock is silica veined and easy to separate in the lime hydrator, but bad for cement manufacture as it is hard to grind.

### Pulverized Charcoal for Kilns

The two 330-ft. rotary kilns of 9-, 8- and 9-ft. diameter have a daily capacity of 600 short tons of cement. They are equipped for oil firing but now burn pulverized charcoal of about 12,000 B.t.u. heat value with a fuel ratio of 21 or 22 percent on the basis of clinker. Previously oil fuel consumption was 14.5 on the basis of clinker, with 18,000 B.t.u. fuel,



## THEY ASK NO QUARTER

Plat-O Vibrating Screens "ask no quarter." They are built for the tough grading jobs . . . where the screen is under heavy load, hour after hour . . . where dependability is put to the continuous test.

Only two bearings (both oversize) are used and neither one supports the screen's weight. Oil lubrication (no grease) reaches every moving part and surface, permitting operation at higher speeds with less heat. Framework and sides are of heavy steel and are all-welded. The same goes for every other feature . . . each is designed and constructed for hard usage, day in and day out.

That's why—for better sizing, cheaper—more and more operators are specifying Plat-O Screens. For your operations, there's a complete line to choose from: one, two, three and four-deck models ranging in size (actual screening area) from 2½'x4' to 5'x12'.

### DEISTER MACHINE COMPANY

Fort Wayne 4, Indiana



so in heat requirements just as good results are obtained with one as the other fuel.

The kilns are entirely modern and are equipped with grate clinker coolers. One unusual feature is that, due to the extremely high cost of refractories, they line the hot zone of their kilns with home-made brick compounded of clinker bound with cement.

They operate under accurate chemical control so are not overly bothered with rings and discharge of lumpy masses that interfere with proper functioning of the cooler.

It takes power to operate textile mills and cement plants and the company produces its own by means of three interconnecting water power plants. The water from a river flowing 8 cu. m./sec. is used twice, first at a head of 9 meters developing 3500 kw. for the textile plant, and at 6 meters head to develop 2500 kw. for the cement plant. The power division is charging 1 cent per kilowatt to the cement and textile mill.

The third water power plant, of 6000 kw., located in a very remote section, is used entirely for stand-by purposes, so there is a certainty that there will be no interruption of plant operation. To avoid operating interruptions, nothing is left undone and great resourcefulness is shown, which is exemplified by the following two incidents.

### Make Gypsum from Limestone and Sulphuric Acid

Gypsum needed for cement comes from the extreme north of the country. War and German submarines brought on a transportation crisis which stopped the delivery of gypsum. For one month there was none, but they made their own out of limestone powder and sulphuric acid.

The war also stopped normal supplies of oil and it was necessary to resort to charcoal. The kilns were not equipped with the necessary mills, so charcoal was pulverized in cement mills, sacked, carried over to the firing hood and injected, thus avoiding any interruption in production of the vitally needed cement until the fuel mills were obtained.

The Sorocaba plant, however, is not only a cement plant, in fact it is more diversified than any rock products plant in the Latin-Americas. There is a lime plant with six kilns calcining either high calcium, dolomitic or silicious limestone, whichever is in demand. There is little to be said for the lime plant. It is as good as South American plants go, but hopelessly obsolete in the light of modern practice, and contrasts ludicrously with their very modern cement plant. However, that means little, as a complete change will soon take place. The plant, however, has other noteworthy subdivisions. One of these is a precipitated chalk plant where lime is recarbon-

*No other light-weight  
pipe offers mine operators  
the performance of*  
**NAYLOR PIPE**



Sizes from 4" to 30" in diameter.

Thickness from 14 to 8 gauge.

Lengths up to 40 feet. All types of fittings, connections and fabrication.



### Installation

Light weight simplifies handling, makes Naylor easier to install.

Lockseam Spiralweld structure holds true cylindrical form.

Accurate diameter and concentric ends speed assembly.

Advanced-type coupling methods cut installation time.

### Service

Exclusive structure produces stronger, leak-tight, safer pipe.

Safety feature absorbs shock loads, vibration, expansion and contraction.

Naylor Pipe handles jobs normally requiring heavier-wall pipe, thus saving steel.

### Economy

Light weight cuts shipping and handling costs.

High salvage and re-use provides substantial savings.

### NAYLOR PIPE COMPANY

1237 EAST 92nd STREET, CHICAGO 19, ILL.

New York Office:

350 Madison Ave., New York 17, N. Y.

**NAYLOR LOCKSEAM  
SPIRALWELD PIPE**

ated with CO<sub>2</sub> gas from the lime kilns.

### Agricultural Limestone

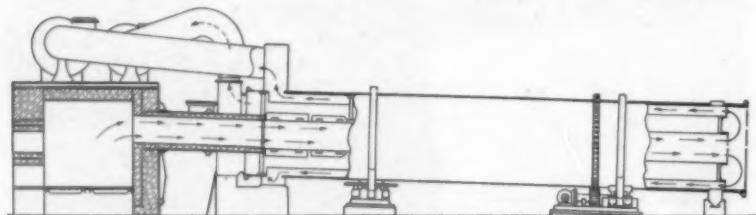
Still another and very important operation is their agricultural limestone plant, where 40 tons are ground daily to 92 percent through 200 mesh, sacked in used cement sacks and sold very readily. I would call this very important, not so much from just the company's standpoint, as from that of entire South America. With the possible exception of Argentina, which has remarkably rich and well balanced soil, much of that in Brazil, Peru and Chile, and no doubt in

other countries, is poor and to a considerable measure exhausted or unbalanced. In Peru, complaints are heard that after a few years, grapes, oranges and other fruits lose their taste, in Chile acidity of some soils is 5 to 6 pH. when it should be 7 to 8. Still such plants as this agricultural limestone plant of Votorantim are very scarce.

From that three-legged shoe-maker's stool there grew a many legged industry indeed. They talk of rock wool plants and of mortar plants and ready-mixed concrete plants to be, of mineral cattle feed and many other things, waiting only

for technical talent and machinery. The president of Brazil himself stated that the greatest need of Brazil is for good technicians. All quotas on Scandinavian and Swiss engineers have been removed. The technician is needed and wanted in Brazil, probably more so than anywhere else in the world. It is a great country of immense undeveloped natural sources and also undeveloped human resources.

Brazil has many men of vision, of ambition, high grade executive type of business men, although some of them are too narrow of view and have their attention focused too sharply on the immediate profit rather than the general welfare of the State. Men in command in Brazil, and for that matter in all Latin-American countries, must labor to bring forth from within their own countries the needed inventors, engineers, foremen, and high grade mechanics.



## "RUGGLES-COLES" CLASS XB DRYER

For indirect heat drying of kaolin, clay, chalk, talc and pigments without contamination from the products of combustion and with low dust loss.

The first Class B Dryer was designed and installed in 1901 and during the past 44 years we have installed several hundred indirect heat dryers handling many different materials. Why not take advantage of this experience and let us recommend a dryer that will meet your requirements.

Write for Bulletin 16-C.

# HARDINGE

COMPANY, INCORPORATED, YORK, PENNA.

NEW YORK

CHICAGO

SAN FRANCISCO

TORONTO

### Kentucky Stone Assn.

KENTUCKY CRUSHED STONE ASSOCIATION has been organized with headquarters in Louisville, Ky. The state association will operate in close harmony with the National Crushed Stone Association. Officers are as follows: Carl Sparks, president; V. C. Morgan, vice-president; Gilbert Brunnhoeffer, treasurer; James R. Thompson, secretary (president of the Blanton Stone Co., Frankfort, Ky.). Directors are as follows: Gilbert C. Brunnhoeffer, secretary-treasurer, Louisville Crushed Stone Co.; S. P. Burnam, president, The Kentucky Stone Co.; W. T. Caldwell, president, Caldwell Stone Co., Danville Ky.; S. W. Hillman, president, Tygart Limestone Co., Carter, Ky.; V. C. Morgan, secretary-treasurer, The Kentucky Stone Co.; J. F. Pace, president, J. F. Pace Construction Co., Morrowbone, Ky.; and Carl Sparks, president, Cedar Bluff Quarries, Princeton, Ky.

### New Mexico Fluorspar

UNITED STATES GEOLOGICAL SURVEY has been making a study of the fluorspar mines in the Zuni mountains of Valencia County, New Mexico. A preliminary geologic and topographic map showing the results of this study is now available for inspection in Washington, D. C., and at the New Mexico School of Mines Library, Socorro, N. Mex. The 21 and 27 mines, about 14 miles southwest of Grants, N. Mex., are in one of the most productive fluorspar areas in the West. Mines are being operated by the Zuni Milling Co. Ore is treated in a flotation mill at Los Lunas, N. Mex.

### Midwest Institute Meeting

MIDWEST AGRICULTURAL LIMESTONE INSTITUTE held a meeting at Springfield, Ill., March 13 at which the old officers and directors were reelected.



## Ohio Agstone

(Continued from page 68)

cent were negative. An increase of 35 percent in tonnage spread was expected by those anticipating an increase.

(4-a) What grades of liming materials do you plan to produce in the postwar period? Of those replying, 56 percent planned to produce agricultural meal; 60 percent agricultural ground limestone; 28 percent agricultural pulverized limestone; 24 percent agricultural superfine limestone; and 16 percent hydrated lime.

(4-b) What proportion of your total agricultural liming materials production will be represented in these grades?

	Percent of total production by classes			
	100-76	75-51	50-26	25-0
Agricultural meal .....	32	12	4	8
Agricultural ground limestone ..	28	16	8	8
Agricultural pulverized limestone ..			4	24
Agricultural superfine limestone ..				24
Hydrated lime .....				16

(Percentages of those replying)

The weighted probable postwar production of these several grades from the expected tonnage gave the following expected postwar grade production: agricultural meal 56 percent; agricultural ground limestone 37 percent; agricultural pulverized limestone 4 percent; agricultural superfine limestone 2 percent; hydrated lime 1 percent.

(5) (a) Tons of all grades sold in 1943—1,053,983; (b) Tons of all grades sold in 1944—1,285,114; (c) Estimated tons per year in postwar period—1,674,771.

From the above data given, the following may be predicted for those processors reporting: 1944 production shows an increase of 23 percent over 1943; postwar production may show an increase of 30 percent over 1944; postwar production may show an increase of 60 percent over 1943.

(6) With your present plant facilities and dealer organization, by what percentage over 1944 could the yearly production of your present plant facilities be increased if you could make shipments regularly for 6 months; 8 months; and 10 months?

The average increase of the individual plants of those replying to this question were: for 10 months, 38 percent increase; for 8 months, 22 percent increase; for 6 months, 15 percent increase.

Based on the 1944 tonnage of these 25 processors, the total increase in production would be: for 10 months, 31 percent; for 8 months, 18 percent; for 6 months, 11 percent.

## Metal Works Overtime

### in the Tip of this Pulverizer Hammer . . .

Picture S-13 shows two Amsco-Clark renewable tip pulverizer hammers of original design (patent applied for); one new, the other after long service which has finally worn the tip off, exposing the hooks on the shanks that support the tip.

The new complete hammer weighs 110 lbs. (shanks 57½, tip 52½). The worn complete hammer weighs 73½ lbs. (shanks 57, tip 16½). 68.6% of the metal of the tip was worn away before the tip finally had to be replaced. With these manganese steel hammers, two-thirds of the tip is actually used, affording a great saving in discarded metal.

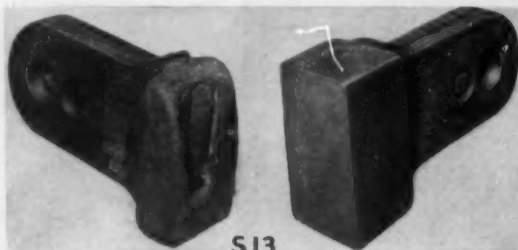
Such performance is possible only when the hammer is made of "the toughest steel known." The terrific impacts involved at high speeds which might fracture ordinary hammers and probably wreck the machine have only the effect of work-hardening austenitic manganese steel hammers and giving them a longer life than any other steel by enhancing wear resistance.

Picture S-14 presents Amsco-Clark pulverizer hammers of an improved design, which is shown in Fig. 5. The reversible tips of these hammers permit practically

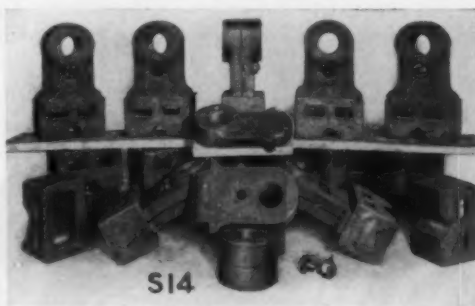
all the metal to be utilized.

The time required for removing old and replacing new tips in Amsco-Clark hammers is negligible. There is no guessing when tips need changing because the remaining shank-protecting metal is always visible. There is no operating stress on the shank bolt used to hold the assembly together. The tip cannot work or wear loose and come off the shank so long as the shank is on the supporting rotor pin.

Ask for Bulletin 642-C, which describes and pictures many types of Amsco manganese steel pulverizer, crusher and grinding mill parts.



S13



S14

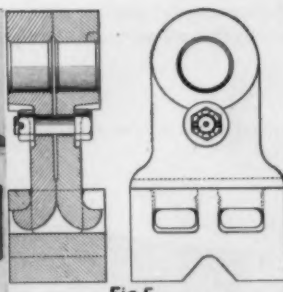


Fig 5

Hammer heads and other pulverizer parts subjected to wear can be restored with Amsco Welding Rods; get bulletin 941-W.

**Amsco**  
AMERICAN MANGANESE STEEL DIVISION  
Chicago Heights, Illinois

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.  
OFFICES IN PRINCIPAL CITIES

AMERICAN  
**Brake Shoe**  
COMPANY



## Pre—, in—, or postwar, Taylor Spiral is a great idea

Even after an idea has been thoroughly out-moded it takes a long time for it to die off completely. Take the old idea that weight and strength go hand in hand, for example. It belongs to the age of the walking beam engine, but it still has a way of creeping up into this age of *functional design*. Nothing less could explain the widespread use of heavy pipe for low and moderate pressure services that could be handled equally well and far more economically by light-but-strong Taylor Spiral Pipe.

By heavy pipe, we do not mean the extra heavy kind; we simply mean pipe heavier than needed for the job at hand. The pipe ordinarily used for the wide range of services like those listed below is Standard Thickness. Yet far lighter Taylor Spiral Pipe can handle any of these everyday piping requirements adequately and with strength and service life to spare. In keeping with all

modern engineering practice, anything heavier than needed is *too heavy* . . . too cumbersome . . . too costly.

The high strength-to-weight ratio of Taylor Spiral Pipe is due to the spiral seam which reinforces it from end to end—gives it greater strength than any other type of pipe of equal weight. In many cases, this lighter weight cuts the installed cost of Taylor Spiral to half that of the heavier pipe it replaces. Think what that means in terms of your run-of-plant piping!

Changing to Taylor Spiral for such services is made practical by the range of sizes and variety of fittings. Thicknesses range from 12 to 6 gauge; sizes from 6" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service and undivided responsibility.

### TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.



#### CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

# ROCK PRODUCTS' CONCRETE PRODUCTS and Cement Products

— MINING CONCRETE PIPE CO. MANUFACTURES AND INSTALLS CONCRETE PIPE

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# Concrete Masonry Units For Public Buildings



Public health center in Detroit, Michigan. Block made by Cinder Block, Inc., Detroit.



U. S. Army embarkation post office shown under construction at Long Island City, N. Y. The side wall, 35 ft. high and 957 ft. long is constructed 12 in. sand-gravel block made on Besser Plain Pallet machines by National Brick Co., Long Island City.

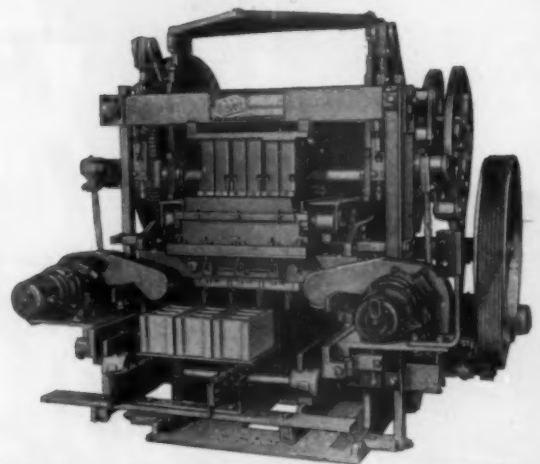


Public market in Tacoma, Washington. Block made by Holroyd Company, Tacoma.

Some typical public buildings constructed with concrete masonry units made on Besser Plain Pallet machines. The durability, safety and beauty of concrete masonry is recognized in every building field.



Public recreation building in Detroit, Michigan. Block made by Cinder Block, Inc., Detroit.



Besser Super Automatic Plain Pallet Vibrapac. Capacity 600 8"x8"x16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

**BESSER  
VIBRAPAC**



## Important Patent Notice

Licensed under the Gelman basic vibration patents.

Undirectional vibration licensed under Flam patents.

The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

## BESSER MANUFACTURING CO.

204 Forty-Fifth St. Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

# Big Farm Demand for TANKS

Mission Concrete Pipe Co., San Antonio, Texas, busy supplying ranches with tanks for water, graneries, silos, and oil. Designs new type reinforced precast concrete units

By H. E. SWANSON



Showing truck equipped with special crane and winch mechanism for lifting tank sections into place

**P**RECAST reinforced concrete cisterns, water tanks, reservoirs, oil storage tanks, silos, graneries, septic tanks, and material bins for ranches and farms, are now being produced by the Mission Concrete Pipe Co., San Antonio, Texas. The patented design of the "Neu Units," as they are known, was originated by A. O. Neuman, president of the company.

Units are cast in steel forms with a concrete composed of pea gravel, coarse sand (from  $\frac{1}{4}$  in. down), and high early strength cement. Concrete of a plastic consistency is placed over  $\frac{3}{8}$ -in. reinforcing which has been accurately set in the forms. The forms are then vibrated to give the surface a smooth finish as well as to create a higher strength. Stave molds are placed on vibrating tables, and larger forms are vibrated externally.

## Advantages

Water tanks constructed from these units eliminate the necessity of metal bands or hoops to hold the structure together. The mineral content of the water in this region soon destroys the metal hoops used on

cypress tanks as well as the old style concrete stave tanks and cisterns. Silage acid also disintegrates the hoops on concrete stave silos. The "Neu Unit" structures are built entirely of precast reinforced concrete units with no hoops and no exposed reinforcing, and are therefore not affected by mineral action. This insures a long life for the structure. The method of manufacture, delivery, and erection of the "Neu Unit" structure is very economical, requiring no foundation, or excavation. Mixing and pouring concrete is unnecessary. Leveling the ground with a sand cushion on which structure is to be erected is the only preparation necessary prior to erection of the tank.

## Casting the Sections

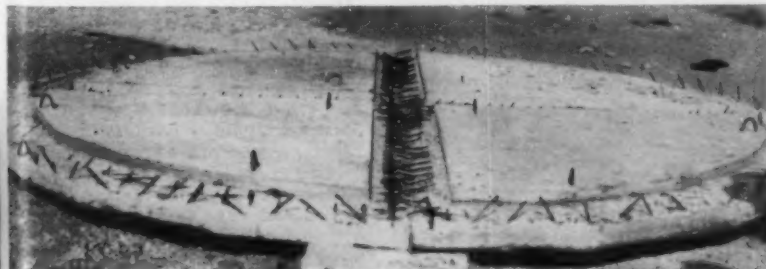
For tanks 6 ft. in diameter, single circular sections are cast. They are 30 in. high and  $2\frac{1}{2}$  in. thick. For tanks  $7\frac{1}{2}$  ft. in diameter, sections are cast 36 in. high by  $2\frac{3}{4}$  in. thick. Sizes from 9 to 12 ft. in diameter, made in four sections, are 36 in. high. The 9 ft. diameter sections are

3 in. thick while the 12 ft. diameter sections are  $3\frac{1}{4}$  in. thick. Sizes as large as 16 ft. in diameter are cast in six sections, 36 in. high and 4 in. thick. Sizes larger than this are constructed of staves, which are cast 24 in. high and either 10 or 20 in. wide. The regular, or 10 in. stave, is  $2\frac{1}{2}$  in. thick while the larger size is 3 in. thick. However, any diameter tank from 8 ft. up can be constructed with the staves if so desired.

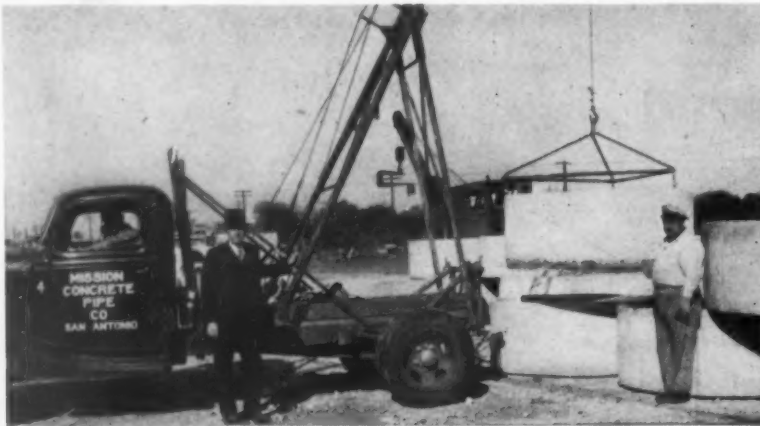
Accompanying illustrations show the two staves as well as the forms in which they are cast. As can be seen from the illustration, the staves have grooves on each side as well as protruding reinforcing. Rich cement mortar is placed in the grooves when the staves are placed together, to firmly bond and seal the joint. The reinforcing bars form an overlap of  $2\frac{1}{2}$  in. at the joints, with the bars of one stave extending into the groove of the opposite stave and vice versa, in a staggered pattern.

## High Pressure Belts

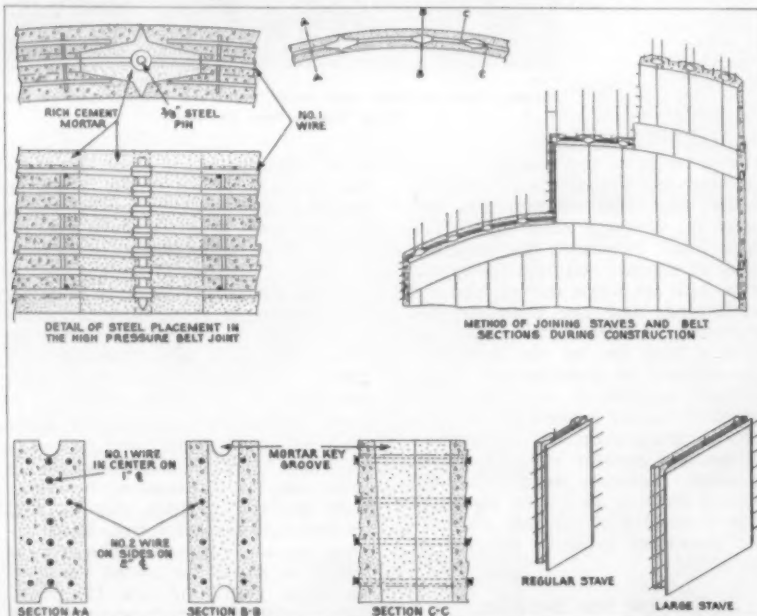
For large tanks, high pressure resisting precast reinforced concrete belts are placed between rows of staves in construction. The size of the belt is 4 in. wide by 8 in. high and 60 in. long, which length covers six 10-in. staves. Each belt is reinforced with eight No. 2 wires, also six No. 1 wires which are welded to the eight No. 2 wires and extend into the slots with loops, or rings, bent on ends. These loops overlap, and steel pins are driven through, thereby forming a continuous reinforcing around the entire belt. Belts are so set that vertical holes through the belts are directly over the joints between staves through which addi-



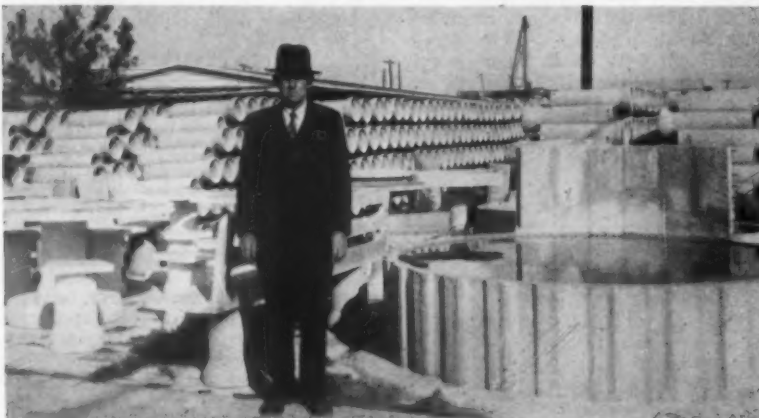
Tank base, in four sections, ready for grouting. Reinforcing steel overlaps at joints, the grout joining sections firmly together. Steel around circumference will join with ring to be placed on base



Truck, equipped with winch and powered by take-off from truck engine, is used to lift pipe and tank sections. Note welded steel frame with chains and hooks for lifting tank sections



Details of reinforced concrete staves and high-pressure concrete belts used in constructing water tanks, silos, reservoirs, etc. Section A-A, B-B, C-C, show details of steel placement



A. O. Neuman, president of the company. Stockpile of pipe with specialty products in foreground

tional reinforcing rods are placed. Steel rods,  $\frac{3}{8}$  in. in diameter, are placed in longitudinal grooves located in both belt and stave units for additional reinforcing and strength. Rich cement mortar is then poured into all grooves and slots, thereby tying all units together into a solid reinforced structure. The accompanying sketch shows the detailed method of placement, etc.

Concrete bases and covers for the tanks are precast in sections, the number of sections determined by the diameter, and are joined in much the same manner as are the staves. Overlapping reinforcing rods are covered with grout for union. An accompanying illustration shows the base ready for grouting.

All of the 6 and  $7\frac{1}{2}$ -ft. diameter single circular sections as well as the four- and six-sections in the 9- to 16-ft. diameter units have reinforcing dowels extending into the longitudinal grooves of adjoining sections, top and bottom, thereby tying sections of courses together vertically, avoiding vertical expansion and opening of horizontal joints.

The State Board of Health at Austin was consulted on details of the septic tank which this company constructs from the "Neu Units." As a result, the Board is recommending this tank as well as the cisterns. The septic tank is shown in a sketch accompanying this article.

### Capacities

Capacities of the small cistern for home and farm use are 211 gal. for 6-ft. diameter, and 475 gal. for 9-ft. diameter, per ft. in height. Either of these sizes can be built up to about 25 ft. high. The larger four and six-sections in the 12- and 16-ft. diameter tanks are 846 gals., and 1546 gals., respectively, per foot in height, and can be built up to about 15 ft. high.

For silo construction in the 12- to 20-ft. diameters, and 30- to 50-ft. high, the stave itself for the small diameter and medium height, and the stave with belt for large diameter and extreme height is most adaptable. For large reservoirs 20- to 50-ft. in diameter and 9- to 20-ft. high, ranging from 2350 gals. to 14,688 gals., per ft. in height, the large stave with belt is used.

Units are cast in the storage yard to eliminate secondary handling. For transference to trucks for delivery, a Chevrolet truck equipped with winch and crane attachment is used. The illustration shows how the units are lifted. Hooks are attached to reinforcing bars protruding from the unit at three points of the unit. A chain from each hook is attached to a triangular pipe frame from which other chains connect to the cable of the winch. The winch is powered by takeoff from the Chevrolet motor.

(Continued on page 132)



# Concrete Pipe

## CENTRIFUGAL Process

## of Pipe Manufacture

By M. W. LOVING\*

**P**LACING CONCRETE by the centrifugal method is used in the manufacture of reinforced concrete pressure pipe for water supply, sewage force mains, sewers, culverts and drains. Reinforced concrete lighting standards, telephone poles and piles in lengths of more than 40 ft. are made by the same process. Cast iron and steel pipe of small and large diameters are lined with portland cement mortar, placed by the centrifugal process, when these pipe lines are required to convey active (aggressive) waters to prevent tuberculation and to prevent oxidation of the metal. This phase is discussed later.

Impermeable concrete of great strength and density is produced by the centrifugal process. As stated in *Rock Products*, October, 1944, concrete specimens were sawed from re-

inforced concrete pressure pipe, made by J. E. Miller, Chicago, and tested at Purdue University, that ranged from 10,000 to 15,000 p.s.i. This concrete was made with standard portland cement, with no admixtures, by men who have developed the technique to a high degree of perfection. These centrifugal pipe (Fig. 1), were made in 12-ft. lengths by the Hume process for the manufacture of prestressed or "concrete-steel pressure pipe" for water supply.

### Use Concrete of Plastic Consistency

Concrete of a plastic consistency is used in the manufacture of tubular products made by the centrifugal process, thus the main objective is to remove excess mixing water to

provide maximum strength, density and impermeability. If the concrete mixture is too fluid it will be unmixed by centrifugal force, as is the case with vibrocast concrete products.† Thus it is desirable to use concrete mixtures with a slump of about 2 in. or less to minimize separation of the coarse aggregate during the spinning operation. This is particularly true when the aggregate is a mixture of trap rock and limestone, for example, or gravel, consisting of quartz and limestone pebbles. If a fluid mix is employed, the heavier, coarse aggregate is thrown outward against the mold and the lighter particles, including some of the cement paste, is thrown towards the inner surface of the pipe resulting in pipe of low strength. This condition can be minimized by using a stiff mix

†*Rock Products*, January 1945.

\*Consulting engineer.

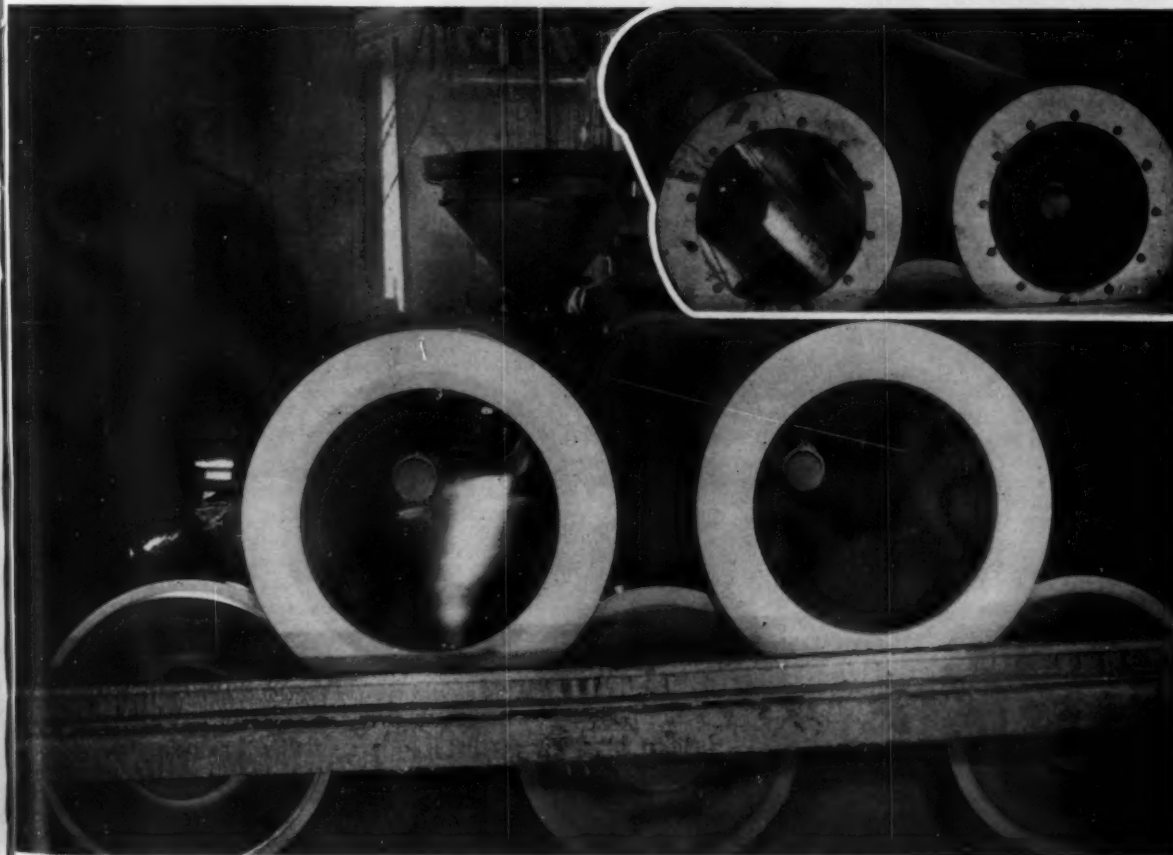


Fig. 1: Spinning concrete-steel pipe; pumpcrete machine in background. Note method of placing longitudinal steel rods (inset upper right) and pumpcrete nozzles for distributing concrete, in the center of each pipe

## CONCRETE PIPE



Fig. 2: Centrifugal concrete pipe machine (Prosser) at Colton, Calif., in 1936

uniformly placed throughout the mold, from end to end, while it is rotating at low speed. At Chicago, a pumpcrete charger, Fig. 1, is used for this purpose and at Los Angeles, a special metal charger, provided with a screeding edge, is used for the same purpose.

In discussing the subject with experienced manufacturers in this country, Canada and in foreign countries, including several articles that have been published abroad on this subject, it is generally agreed that gradation of aggregate, and maximum and minimum peripheral (rim) speeds of the mold are determined by cut and try methods and the best results are obtained by actual experience in the manufacture of small and large diameter pipe and other tubular concrete products.

When one witnesses the manufacture of centrifugal pipe, it is a very fascinating experience and you naturally come to the conclusion that there is nothing to it. But those who have excelled in this type of manufacture have spent a lot of time in research and experimentation to produce the excellent pipe and other tubular products that are on the market in this country today. From what we have seen from catalogs and technical articles published in England, Switzerland and South Africa, the centrifugal process is more extensively used in foreign countries than in the United States and Canada. In fact, a number of important innovations, to reduce manufacturing costs, are in practice that will in time, be introduced in this country.

Pipe are usually made by the centrifugal process in diameters ranging from 12 to 78 in., and in lengths of 8 to 12 ft. By placing dividing rings in the form, shorter lengths are produced for drains, culverts or wher-

ever specials are required. With one exception to our knowledge, all of the products are spun in a horizontal position.

### Hume Process

The Hume process was developed in Australia and first introduced in this country and Canada in 1922, but was not used to any great extent until 1926, principally in California, Hawaii, Michigan and Massachusetts. The steel molds are made in two halves, bolted together and fitted with end rings that govern the shell thickness of the pipe. The external surface of the molds is provided with two circular tires which roll on power-driven trunions. Concrete is introduced in each end of the mold while it is spinning, at low speed, to distribute it from end to end and against the outer form. When the required amount is placed, the peripheral speed is increased and the concrete is densified. The mold is then stopped and the excess water, laitance and other foreign matter is removed. Spinning is then resumed and the inner surface is screeded to a smooth finish.

To avoid excess vibration in the Hume or any other centrifugal process, during the spinning operation, the trunions and tires must be carefully adjusted and maintained as true circles, otherwise vibration may counteract the centrifugal force and the concrete will not be densified. In some cases it may fall from the arch of the pipe when the mold is stopped. This is one of the tricks of the trade



Fig. 3: Solid steel molds (Moir-Buchanan process) Los Angeles, Calif., 1944



Fig. 4: Molds (Fig. 3) are lined with paraffin

that has to be learned and overcome by practical experience.

### Prosser Process

The Prosser process, Fig. 2, differs from the Hume in the means of spinning the mold and was developed in Colton, Calif., and is extensively used in California, Texas and Utah. The master cylinder, shown in the illustration, is made of heavy steel plate and is truly concentric. The outer surface is fitted with two circular, steel tires that roll on trunions similar to those employed in the Hume process. The inner surface of the master ring is also provided with two circumferential steel tires which in turn engage those on the external surface of the pipe mold. Pipe ranging in diameters from 12 to 72 in. are made by this process in 8 ft. lengths or 4 ft. by placing spacer rings in the pipe mold.

### Moir-Buchanan Process

The Moir-Buchanan process was developed in Scotland and is used in California and New York. It differs from the Hume and Prosser processes in that the molds, Fig. 3, are solid cylinders, made in true circles with heavy steel plate and fitted with external circular tires and end rings. So that the finished concrete pipe may be removed from the solid mold, it is first lined with a coating of paraffin about 1/32 in. thick. This is accomplished, Fig. 4, by pouring molten paraffin into the mold, which is slowly rolled on a track until the paraffin hardens evenly over the inner surface. After the pipe is steam cured and the end rings removed, the temperature is raised and the paraffin melts and drips from the ends of the mold. The pipe is easily removed from the mold. A large percentage of the paraffin is recovered for reuse from the side drains provided in the curing rooms for that purpose.

As previously said, the concrete is placed by a circular metal charger, provided with a screw conveyor, uniformly throughout the length of the mold. The inner surface of the pipe is troweled to a smooth finish by a metal blade, attached to the charger.

### Vertical Spinning Process

The only vertical spinning process we have seen, was developed by the California Concrete Products Company, Inc., San Jose, Calif. We witnessed a demonstration of the machine about 15 years ago, before patents were issued, but have no pictures or drawings of it. A 4-ft. vertical mold, provided with a circular steel table is revolved at the required peripheral speeds to properly densify the concrete. The table is the same diameter as the pipe and is raised or lowered during the spinning operation. Concrete of a plastic consistency, of about the same slump as used in the other processes, is dropped

## CONCRETE PIPE

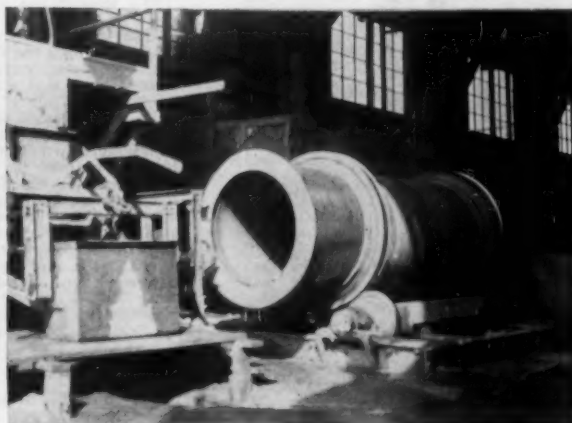


Fig. 5: Left, workmen are fitting the check or spinning ring onto the reinforcement assembly. Right, the pipe is being lined with 1 1/4-in of concrete

on the steel table and is thrown against the mold by centrifugal force. The edges of the steel table govern the thickness of the pipe shell and of course, the diameter of the pipe. Both circular and oval pipe were made in 4 ft. lengths by this process.

The inventor asked me to say nothing about the new process until after patents were issued that year. About two years later I was in Pittsburgh, Penn., and met a friend, from whom I had not heard for some time. He said he had been at work on a new centrifugal process for which he had just received patents. When he told me about it, I said I had seen the same machine in California two years before. He was astounded and investigated the matter in Washington and found that his work and ex-

pense had gone for naught. Several cases of this kind have occurred, to my knowledge, and it pays to consult someone familiar with the concrete pipe industry, other than patent attorneys, before spending too much money on new ideas.

### Reinforcement Assemblies

Steel reinforcement assemblies are rigidly and accurately held in position by steel spacers welded to the cage and extending to and against the mold. One can usually walk on the steel assembly cage before the concrete is placed, without displacing it and that makes for first class results in tests and performance in service. Some manufacturers use small concrete spacers for the same

purpose. Others hold the steel in position by longitudinal steel rods, extending through the end rings, to which the cage is tied or welded. Strange as it may seem, the foreign manufacturers claim that the steel cage is centered, without securing it in position, by centrifugal force. This was tried out in this country without success.

### Lining Cast Iron Pipe with Concrete

Cast iron and steel pipe, as previously stated, are lined with portland cement mortar, usually by the centrifugal process. A report of a test of the remarkable strength and impermeability of such a lining is reported by C. H. S. Tupholme, of Lon-

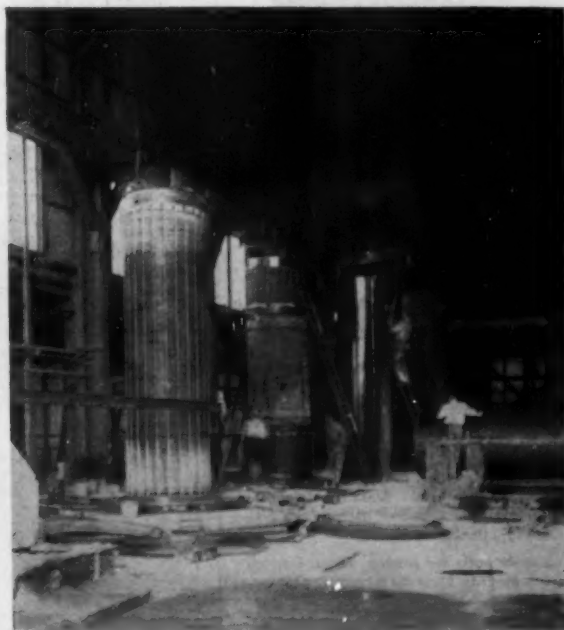
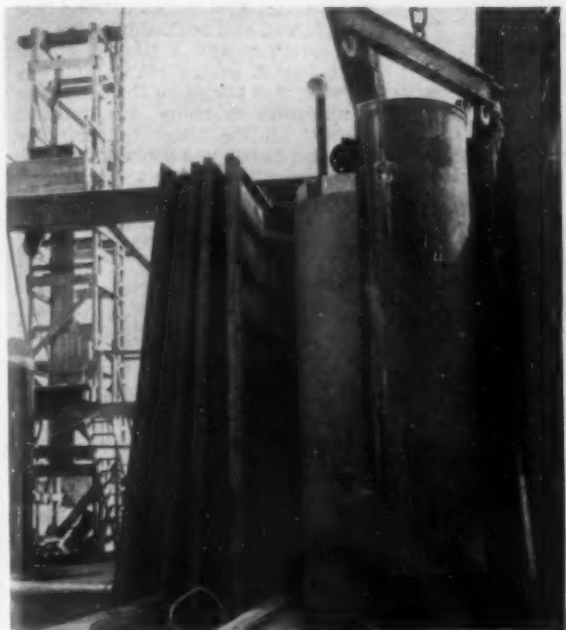
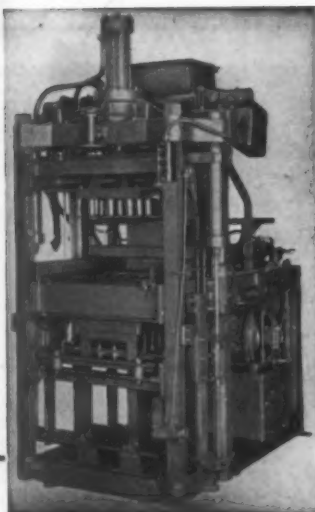


Fig. 6: Left, workmen are removing the external forms after concrete has been steam cured for three hours. While the pipe remained on the base rings it was cured with steam for 24 hrs. Right, reinforcement assembly lined with 1 1/4-in. of concrete and steam cured for three hours

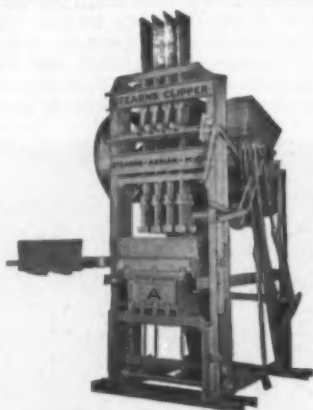




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G. M. Friel, Mgr. Columbus 8, O.

don England,<sup>2</sup> from which the following is taken:

"In testing the adhesion of the concrete to the metal a 27-in. cast-iron pipe with a 1/2 in. lining was used. A hole was drilled through the iron only, just touching the outer surface of the concrete lining. This was then tapped and connected to a pump. Pressure was gradually applied until it reached 560 lbs. per sq. in. This pressure was maintained constant for a period of 10 minutes during which time the pipe was kept under continuous observation. At the end of this interval moisture was seen coming through the concrete lining at a point opposite that at which the pressure was applied. The pressure was then increased to 1,120 lbs. per sq. in. when moisture appeared on parallel circumferential areas 2 ft. long and 12 1/2 in. and 15 in. respectively from the point of pressure application. This concluded the test."

### Subaqueous Water Pipe

An interesting installation of this type of pipe is a 48-in. subaqueous water line built in a dredged trench in False Creek at Vancouver, B. C., Canada, in 1939. The line operates under a maximum unbalanced static head of 483 ft. (210 p.s.i.), and conveys fresh drinking water under a salt water course; thus the joints were made and are today bottle-tight. The 48-in. reinforced concrete pipe were manufactured in 16-ft. lengths with a total wall thickness of 6 in., each pipe weighing 10 tons. The unreinforced lining of the cylinder, 1 1/4-in. thick, was placed by the centrifugal process and the external concrete cast and vibrated. The lining was steam cured for three hours before proceeding with the casting. After completion of the concreting, the pipe was steam cured for three hours, the molds removed, and steam curing continued for another 24 hours. The pipe was then removed to the storage yard and water-spray cured for 14 days.

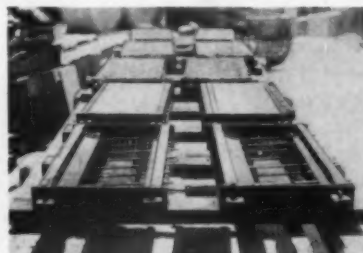
<sup>2</sup>Coal Age, October 16, 1924.

### Concrete Tanks

(Continued from page 128)

Services of the Southwestern Laboratories have been obtained to make

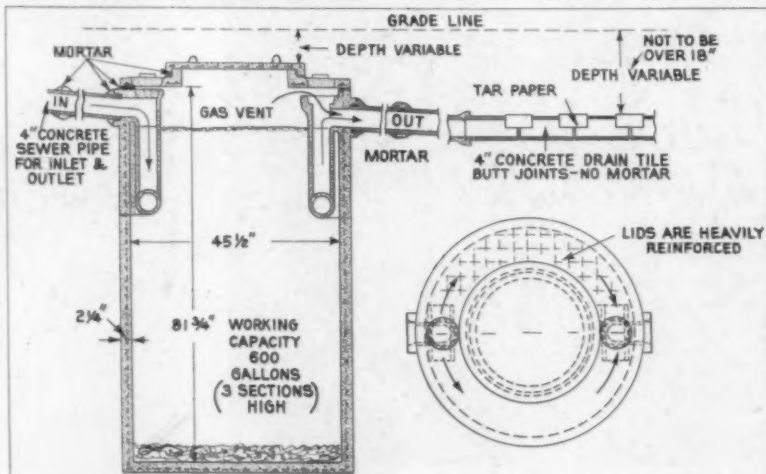
both tensile and compressive strength tests. A typical test by this laboratory to determine strength of a joint in tension was made as follows: Two precast staves, 10- x 24- x 2 1/4-in., taken from stock, were joined with one 1 1/2 in. cement-sand mortar in



Forms used to cast staves. In the foreground are forms ready for concrete; reinforcing in place

the same manner as in service. The key of the joint thus formed was 1 1/4 in. wide by 24 in. long. Each stave contained reinforcement of cold drawn No. 2 wire on 3 in. centers making eight strands per stave. Each wire extended 3 in. into the open grooves of both edges, so that when the joint was formed the steel lap between the two staves was 2 1/2 in. With the joint thus formed and placed in a horizontal position, steel grips, 3/8 x 1 1/2 in., welded to the top and bottom of joint wires, served as connections for testing. The tensile strength of this specimen under a total load of 10,000 lbs. was 333 p.s.i. The joint remained unbroken and the break appeared through the stave flanges.

For compression tests, the staves were laid on a 2- x 4-in. timber frame with 10-in. centers. The specimen was placed with the convex surface up. Two inches of sand was then spread and packed over the entire specimen and a timber, of the same length as the staves and 7 1/2 in. wide, was placed on the sand. The compression machine was brought to bear on the latter timber. The load was distributed directly over the



Details of reinforced precast concrete septic tank which has been approved by Board of Health

joint of the two staves joined together, bearing 5 in. on each side of the joint, or the full width of one staff. A total load of 9800 lbs. exerted showed a strength of 41 p.s.i. on the total area or 408 lbs. per lineal inch of joint. A number of tests were made and above results shows the average strength.

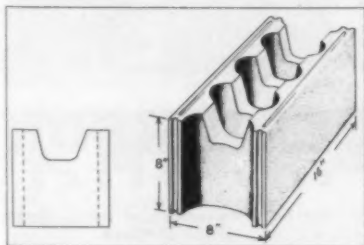
Production of the "Neu Units" was started in July, 1944, on a small scale. The first tank was erected in August. Since then, "Neu Unit" cisterns and tanks as well as larger reservoirs have gained such popularity that production has been doubled and tripled and still more forms and equipment are being added to keep up with the demand. In addition, this company has been making sanitary sewer and culvert pipe since 1927. Five pipe machines are in operation. Many specialty units are also produced, such as ornamental concrete tables and chairs for gardens, stepping stones, curbing and walk slabs, and foundation blocks. A. O. Neuman, who has been in the concrete pipe and products business since 1902, is president of the Mission Concrete Pipe Co., E. A. Neuman and A. W. Anderson are vice-presidents; W. P. Neuman is secretary-treasurer; and Clyde V. Cochran is sales manager.

### Concrete Products Census

BUREAU OF CENSUS, Department of Commerce reports that forms are now going out to the concrete products industry seeking information for a quarterly survey of production, shipments, stocks, and unfilled orders of Concrete Masonry and Other Structural Products (1944). The War Agencies, states Maxwell R. Conklin, Chief, Industry Division, urgently need the information called for on Form WPB-3923 in order to assist them in the selection and procurement of building materials.

### Beam Block

HAYDITE CONCRETE PRODUCTS CO., San Rafael, Calif., manufactures a so-called beam block, shown in the illustration, which is in considerable demand in California. It is made on a standard block machine with a special pallet in 6, 8, and 12-in. widths with a recess 2 1/4-in. deep. The recess provides space for rein-



Beam block made with a recess for steel reinforcing

forcing steel and the surrounding concrete mortar. Turned down, the beam block becomes a lintel. Screen wire is used to hold the concrete mortar in place.

### Cast Stone Changes

ACTIVITIES of the Cast Stone Institute will be limited as the result of action by the Board of Directors at a meeting held in Philadelphia, Penn., on February 16 and 17. The Institute will now function primarily to disseminate trade information to its members and to its public. Conventions will not be held until wartime conditions permit. Headquarters

and the office of the Institute have been removed from Washington, D. C., to P.O. Box 606, New Haven 3, Connecticut, with Herman Frauenfelder as managing director.

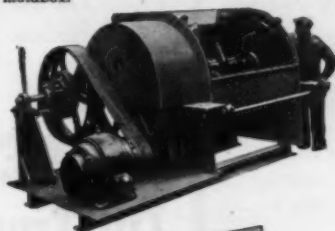
### Building Products Plant

BEND CONCRETE PRODUCTS CO., Bend, Ore., will build a \$15,000 structure to house a concrete products plant, according to R. P. Syverson and L. N. Eisenbach, owners. Mr. Eisenbach will manage the plant. Concrete brick and block, pumice concrete block, vari-colored tile and brick, and concrete pipe will be manufactured.



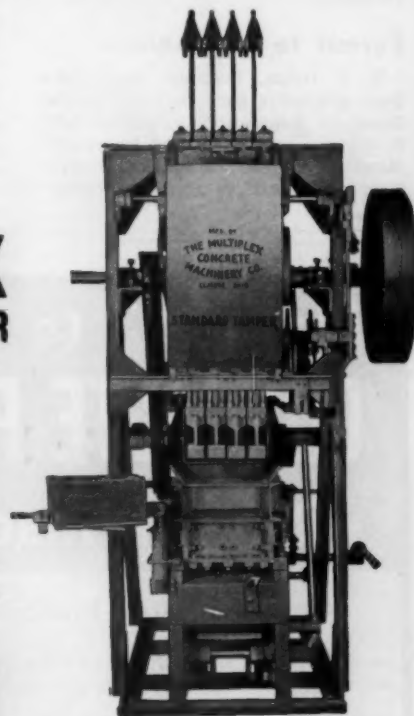
## MULTIPLEX STANDARD TAMPER

• Your reputation as a concrete block manufacturer is wrapped up in every block you turn out. And the best guarantee to building a lasting reputation is the assurance that your own facilities will turn out block of a uniformly high quality. The Multiplex 8-bar Standard Tamper has already helped many manufacturers build a strong reputation. It produces from three to four 8 x 8 x 16 in. units a minute. It can be used for making both plain and stripper, or face blocks, on one base. Time feeding while tamping and hopper agitation account for better units. The strike-off hopper assures a smooth top. The Multiplex Standard Tamper has a rugged, all-steel welded frame and reinforced moldbox.



THE MULTIPLEX COMBINATION  
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## Announcing Plasticrete

PLASTICRETE CORPORATION is the new name of Hamden Building Tile Co., Hamden, Conn. All products of the company will be known under the trade-name, Plasticrete, which will be widely advertised. A beautiful eight-page announcement folder was recently sent out by the company to builders and contractors, telling about the new name and describing the manufacture of cinder concrete masonry units. On the cover is a beautiful reproduction in color of the famous painting, "A Connecticut Farmhouse" by Maxfield Parrish.

## To Build Pipe Plant

PITTSBURGH COKE & CHEMICAL CO., Pittsburgh, Penn., plans to construct a plant for the manufacture of concrete pipe and other concrete products, such as ties and cribbing. The plant will be erected on Neville Island next to its present manufacturing facilities.

## Permit to Make Block

F. J. BIRKS, Downey, Calif., has been granted a zone variance by the Board of Supervisors to permit him to erect a concrete block plant adjacent to the west of the San Gabriel river and north of Firestone boulevard.



Group of Besser Manufacturing Co. officials at luncheon. Left to right: Jack Franklin, W. L. Fuller, James A. Rhodes, Jesse H. Besser, president; Haakon Paulson, Del Fox, Lewis G. Galloway, and Jonathan J. Buzzell.

## Sell Concrete to Women

AT A LUNCHEON attended by representatives of the press and radio on March 14, the Besser Manufacturing Co., introduced its new Public Information Service designed to disseminate information about concrete masonry to the public in general and the women in particular. Headquarters of this service are at 551 Fifth avenue, New York, N. Y. Jesse H. Besser, president of the company, pointed out that women's interest in homes goes beyond wallpaper, kitchen equipment, and other external decorative effects. They are also interested in the comfort, durability, and practicability of concrete masonry for homes. Sally Woodward, public relations counsel, directing this new service, explained how the company plans to bring to the attention of women throughout the country the advantages and beauty of homes

built with concrete masonry which may now be built in every desired type of architecture and with units in colors and different type of surface textures for both exterior walls and interior treatment.

An attractive booklet entitled, "Planning Your Home" has been prepared to answer many questions regarding the use of concrete masonry in construction of homes. Some typical, beautiful residences constructed of concrete masonry are shown, and a cross section shows how concrete masonry, floor units, partition wall units, and concrete roofing tile are used.

## Concrete Pipe Factory

MISSION CONCRETE PIPE CO., San Antonio, Texas, is planning the construction of a new building to cost \$20,000, according to President A. O. Neuman.

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But whatever you build of concrete, whether it is a firesafe concrete house or farm building, garage, foundation, loading platform or an industrial driveway, you give your customer low annual cost—the true measure of building economy.

Helpful "how to do it" literature on concrete improvements for industrial or commercial uses or on farms is available to you on request. Free in United States and Canada. Please specify type of information desired.

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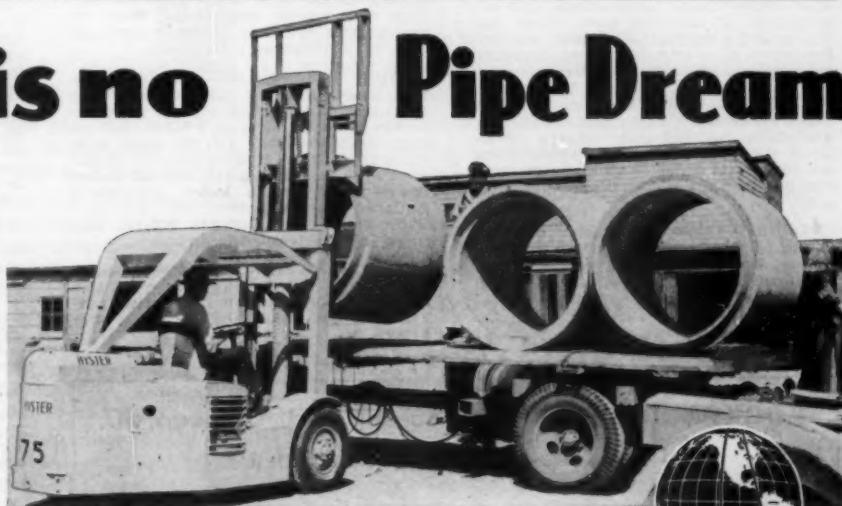
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# INFORMATION

## TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by  
merely checking and mailing the coupon below.

**1 AGITATORS**—H. K. Porter Co., Inc., has released a new catalog describing and illustrating numerous types of mixers, agitators, blenders, ball and pebble mills, kettles and pressure vessels. Many illustrations, engineering drawings and descriptions of operating principles are also included.

**2 BATCHING PLANTS**—C. S. Johnson Co. has issued two new bulletins describing and illustrating portable cement batching plants. The bulletins summarize operating features and uses of each type of plant, together with general specifications.

**3 BUCKETS**—Daniels-Murtaugh Co. has released a new 24-page catalog No. 14, describing and illustrating types HS, H, M and L dragline buckets. The catalog also describes "Coalloader" dippers, and teeth for dragline buckets and dippers of all makes.

**4 COMPRESSORS**—Sullivan Machinery Co. new 56-page Bulletin A-52 describes and illustrates heavy duty 2-stage air-cooled compressors for industrial plants, mines and heavy contracting. The bulletin shows many installations, full descriptions of available sizes, types and drives and construction details; also information as to foundation requirements, regulation, accessories and servicing.

**5 COOLERS**—Fuller Co. new Bulletin CO-3 describes and illustrates air quenching inclined-grate coolers. Blueprint diagrams of various applications are given, also capacities and dimensions, and photographs of actual plant installations.

**6 DRILLS**—Clark Equipment Co. has published a new 32-page pocket size booklet containing illustrations and brief descriptions of Clark Celfor drills and reamers, electric steel castings, metal spoke wheels, front and rear axles for

trucks and busses, transmissions, gears and forgings, fork trucks and industrial tractors, railway car trucks, blind rivets, trailer axle, and the newly developed Booster engine for 1½-ton trucks.

**7 DRIVES**—Allis-Chalmers Mfg. Co. has published a 12-page catalog, No. B-6051-E, describing and illustrating V-belt drives, including the "Magic-Grip" sheave. The catalog also covers the Texrope "Econograph" method drive selections. List prices, stock sizes, dimensions and construction details are included for all Texrope drives. Texrope Vari-pitch sheaves and drives and Vari-pitch speed-changers are also described.

**8 DRIVES**—The American Pulley Co. 24-page Catalog FBD-44 describes and illustrates flat-belt drive equipment including split pulleys and bushings, shaft collars, shaft hangers and bearings, split and solid conveyor pulleys, hi-torque motor pulleys, belting and econ-o-matic drives for short-center flat-belt drives.

**9 DRIVES**—B. F. Goodrich Co. has issued a 44-page handbook on industrial fractional horsepower V-belt drives. Included in the book are horsepower ratings and general engineering data, together with selection tables, prices and data on both sheaves and belts.

**10 DUST COLLECTORS**—Whiting Corp. has released five new bulletins describing and illustrating various types of dust collectors, namely, Bulletin FY-131 features type SHH; Bulletin FY-132 deals with types GA and GP Hydro-Clone for grinders and polishers; Bulletin FY-133 covers Hydro-Clone cupola spark suppressor; Bulletin FY-134 covers the dry type Hydro-Clone, and Bulletin FY-135 features the air tempering unit.

**11 FLOOR COVERINGS**—Truscon Laboratories has released a 4-page Bulletin No. 553, describing and illustrating Saf-T-Dek, a skid-proof floor, deck and stair

covering which is applied with a trowel to a thickness of about 1/32 in. and sticks to wood, steel, concrete and glass.

**12 FURNACES**—Harper Electric Furnace Corp. has published Bulletin 1044 describing and illustrating inverted pit type electric furnaces for use in melting ceramics, alloys and other materials in crucibles at high temperatures ranging between 1500° F. and 2950° F. One feature of the furnace is the convenient lifting mechanism used for raising and lowering the crucible.

**13 GEARS**—The Cleveland Worm & Gear Co. has released Catalog No. 300 describing and illustrating Speedaire fan cooled worm gear reduction units, which is fully detailed by cutaway photographs, charts, diagrams and engineering tables. Detailed instructions for planning installations are included, also rating tables for six sizes ranging from 4-3/4 in. to 12 in. centers.

**14 INDICATORS**—Fuller Co. has released Bulletin I-2, illustrating and describing material-level indicators and motion safety switches. Typical applications are also shown.

**15 KILNS**—Vulcan Iron Works has published an interesting bulletin, No. 381, entitled "Trouble-Free Operation," which describes and illustrates how mechanical troubles in the operation of rotary kilns can be prevented through adequate care in mounting and maintenance, including rotary dryers, coolers, roasters, retorts, calciners, etc.

**16 NOZZLES**—Chain Belt Co. has released a new Bulletin No. 459 describing and illustrating REX flat spray nozzles. The bulletin also illustrates the many uses for this nozzle and gives dimensions, sizes and prices.

**17 PUMPS**—Chain Belt Co., new Bulletin No. 447 describes and illustrates Rex speed prime pumps which are made in sizes from 1½-in. to 8-in. with capacities ranging from 3000 to 125,000 gal. per hour and can be used for dewatering excavations, pumping out manholes, and for farms and estates.

**18 SCALES**—Howe Scale Co. has published three bulletins, Form 601, describing truck scales; Form 550, illustrating scales for packaging, checkweighing, balancing, testing, counting and compounding; and another bulletin on various types of counting scales.

**19 SCALES**—The Yale & Towne Mfg. Co. has issued a new bulletin displaying the important role played by precision industrial dial scales in American industry by eliminating losses found in inefficient methods of weighing, counting, batching, measuring and testing bulk and unit materials in solid, liquid, or gaseous form.

**20 SCREENS**—Allis-Chalmers Mfg. Co. has released Bulletin B-6330, describing and illustrating low-head horizontal vibrating screens for wet or dry screening of sand, gravel, crushed stone, and various types of metallic and non-metallic ores.

**21 SHOVELS**—General Electric Co. new Bulletin GEA-4161 describes and illustrates the ampidyne control device for electric shovels, which may be used for all motions and is easily applied, operated, and maintained.

**22 TRACTORS**—Caterpillar Tractor Co. has released a new 16-page bulletin Form No. D-47, describing and illustrating the work done by tractors at the war front and in the fields.

**23 TRUCKS**—The Euclid Road Machinery Co. has issued a bulletin entitled "Production with Rear-Dump Euclids" describing and illustrating rear-dump trucks for use in mines, quarries and difficult construction work. Illustrations show many applications for these trucks.

### Cut Out and Mail This Coupon to

**ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago, Ill.**

I would like to have the items circled.

(4-45)

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9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	

Name ..... Position .....

Company .....

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City & State .....

# WHY FLINK Lime Spreaders MAKE YOU MORE MONEY

No shoveler or helper needed . . . spreads more lime in less time . . . permits use of truck for other purposes when fields are wet—and when crops are growing.



You can make money with your Flink equipped truck 365 days in the year!

Trucks equipped with Flink Self-Feeding Lime Spreaders are not limited to the spreading of lime alone. No need having an idle truck stand around all day costing you \$25 in income and expense. Equip your dump trucks with Flink Self-Feeding Spreaders. Spread more lime in less time with less help and less expense when fields are dry and during off seasons when lime spreading can be done . . . on other days and during off seasons, spread sand, gravel, haul equipment, do road work, truck coal,

or use your truck for any of the hundred other jobs for which it was built.

The Flink Spreader is a replacement end gate which can be removed in 5 minutes if you desire, or you can still go ahead hauling and dumping with the Flink spreader left on. Does not interfere with general use of truck.

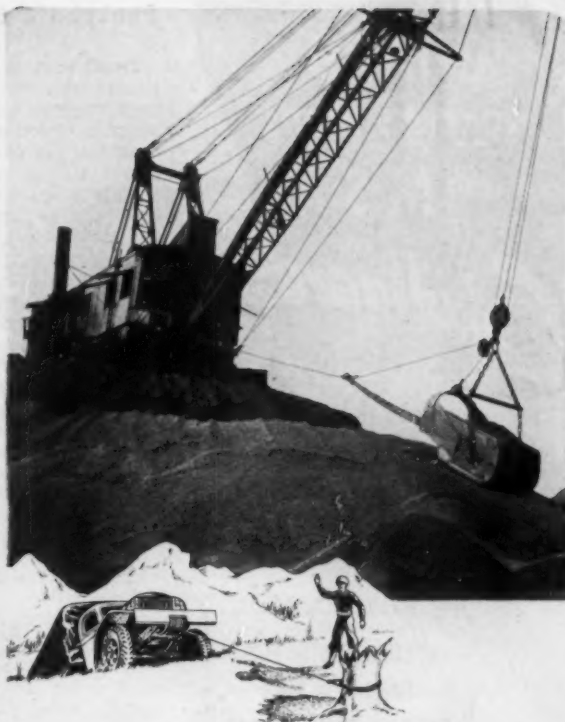
Spreads all granular materials up to 1" thick or thin, wet or dry, forward or backward, without a helper on the back. Spreads 15' to 28' wide, depending on type of ground and nature of material. Built for hard use.

Write for Complete Literature

## The FLINK COMPANY

510 VERMILION ST.

STREATOR, ILLINOIS



## Make wire rope last . . . keep it on the job

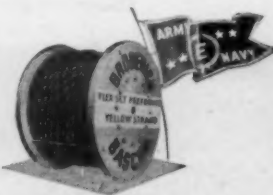
Sharing your wire rope with the armed forces doesn't mean going without; it just means taking care of what you have. For example, inspect it often. Lubricate when indicated. Operate at capacity, but don't overload.

When you must replace a rope, get *Preformed Yellow Strand* for heavy-duty quarry jobs. It's strong, flexible, highly resistant to kinking and fatigue—qualities that result in long rope life. Specify *Preformed Yellow Strand* for hoist and drag lines on your dragline machine . . . for holding and closing lines on clam shells . . . for hoist and swing lines and as rack and crowd ropes on power shovels. B & B engineers will gladly help you choose the right rope and use it right.

**Broderick & Bascom Rope Co., St. Louis**

Branches: New York, Chicago, Houston, Portland, Seattle  
Factories: St. Louis, Seattle, Peoria

## YELLOW STRAND



PREFORMED WIRE ROPE



**GUARD  
WORKER'S HEADS  
with M.S.A.  
Skullgards**



**NEEDED PROTECTION  
FOR EVERY MAN  
FROM QUARRY TO PLANT**

Your workers need M.S.A. Skullgard protection against the hazards of falling objects, blows and hard knocks in general. These famous hats, built of high-pressure molded laminated bakelite, offer a sturdy shield for your workers' heads. Light, tough and strong, Skullgards are unaffected by rain, sun, perspiration, oils or greases. They are comfortable, durable, well-balanced and fit snugly on the head.

Guard your men with M.S.A. Skullgards—the hat that takes care of their heads! The latest Skullgard Bulletin gives you full details. Write for your copy today.



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**MINE SAFETY APPLIANCES  
COMPANY**

Braddock, Thomas & Meade Sts.  
PITTSBURGH 8, PA.

District Representatives in Principal Cities

## Phosphate Sampling

(Continued from page 71)

Dried rock is sampled from each loaded skip car going to storage shed. A series of small cups fastened to arms which are attached in turn to a bar revolved by the skip as it moves up the incline, scoop up a sample from the surface dumping their charge into a container. The bar is spring loaded for return to normal when the skip is past. This sampler works well as long as the car is always loaded high enough to touch the arc swept by the cups, but loading is not uniformly full and hence the sampling suffers.

Since loading from dryer hopper is intermittent, the only alternative would be that of installing a mechanical cutter between end of shell and dryer hopper, a place entailing practical difficulties for most phosphate plants in the Tennessee area.

The sample taken is small, one quartering operation only being permissible before crushing in laboratory crusher.

## Ground Rock Sampling

Ground rock is sampled and analyzed more frequently than other samples because it is not only a finished product, but because it is a means of controlling grinding mill performance. The mills are checked hourly so that customer guarantee as to fineness can be met and at the same time excessive overgrinding eliminated. As discussed in a previous article overgrinding is expensive as it greatly reduces capacity.

The sample is usually taken at the discharge duct of the cyclone, by means of a slotted tube, slipped manually in and out through a collar on the duct wall. The disadvantage of course lies in the fact that only that part of the mill product is sampled which is discharging at the moment of sampling. Some commercial samplers, making use of a miniature screw taking continuous samples, would be the answer to that, but would entail the inconvenience of cutting down a large powdery quantity to a small, representative one—a rather difficult task.

A variation of the manual dust sampler for use in horizontal ducts is that of a small brass tube which samples the flow by making use of the negative pressure on the suction side of the fan. The end of the tube exterior to the duct has clamped to it a small cloth bag to retain the sample. A gasketed cover plate brazed onto the tube a few inches above the bag, clamps over one end of a short piece of 3- or 4-in. pipe, the opposite end of which is connected to the fan through a reducer and a valve. To take a sample the valve is opened until bag is full. The valve is then closed, cover plate clamps removed, and the tube slid clear of pipe—for easy removal of bag.

Ground rock is also sampled as it awaits shipment in bulk cars or bags. This is done with a needle which consists of two brass tubes about 4 ft. long and drawn to a point at one end, one of which is inside the other. Both have small slots spaced at 6-in. intervals along their length which, when in register, give access to inner tube interior either to take samples or to discharge them. In operation the needle with slots out of register is jabbed into the dust to its depth after which the slots are put in register by turning one tube. In this manner a sample of dust from each 6-in. level is caught in the needle. Before withdrawing same the slots are again turned out of register so that no disproportionate quantity of sample gets in from any one level. A small, though representative cross section of the bulk load or bag is thus obtained.

## Sampling Old Tailings

One of the most difficult materials to handle and sample is old tailings (pond sands). One carload (this is loaded into gondolas direct from mining operation) may range in moisture content from 15 percent to 50 percent running the gamut of physical consistency from dry grains and lumps to plastic to fluid. The presence of clay seams alternate with sand accentuates the physical variations, all this causing extreme variation.

(Continued on page 140)

**PULVERIZERS** for the reduction of Cement Materials, Limestone, Agricultural Limestone, Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour

Finenesses: 20 to 350 mesh

**BRADLEY PULVERIZER CO.**

ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—  
To Reduce Power and Maintenance Costs—  
To Insure an Absolutely Uniform Product—

**Use the BRADLEY AIR SEPARATOR**

The smooth, effortless control of the LIMA Type 1201 is made possible through air-operated clutches. This all-important feature assures more economical operation and greater output thru less operator fatigue. A further advantage effective thru air-control is, simplified clutch adjustment. Only one adjustment necessary and when made, will retain the adjustment over a period of several months. A LIMA Type 1201 with air-control means more productive time on the job.

Regardless of how carefully a job is figured, how skillfully it is laid out, profitable results depend on the selection of the right type of equipment and its advantages to make big output possible. The LIMA Type 1201 shown in the illustration is a 3 or 3½ yard shovel (depending on length of boom and handle) or a 65 ton crane. It is in high favor with quarry operators, open-pit miners and contractors who demand top-notch performance from the equipment they buy. Look to LIMA for the shovel, crane or dragline of the right capacity for the job you are now planning.

#### LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division, Lima, Ohio, U. S. A.  
NEW YORK, N. Y. PHILADELPHIA, PA. PITTSBURGH, PA. ST. LOUIS, MO.  
CINCINNATI, OHIO. CLEVELAND, OHIO. KANSAS CITY, MO. MINNEAPOLIS, MINN. ST. PAUL, MINN. CHICAGO, ILL.  
DETROIT, MICH. INDIANAPOLIS, IND. COLUMBIA, S. C. MEMPHIS, TENN. KNOXVILLE, TENN. NASHVILLE, TENN. RICHMOND, VA.  
SAN FRANCISCO, CALIF. LOS ANGELES, CALIF. SAN DIEGO, CALIF. SEATTLE, WASH. PORTLAND, ORE. SPOKANE, WASH. VANCOUVER, B. C.

The LIMA Type 1201 can hoist, swing, travel or boom up or down at the same time. This advantage enables the user to do a wider variety of work without the loss of time due to changing from one motion to another. This is an advantage you will appreciate when working in close quarters or where frequent moves are necessary. Independent clutches are especially desirable when working machine as a crane.

The greatest destroyer of heavy machinery is friction. This profit taking hazard is overcome in the LIMA Type 1201 by the use of anti-friction bearings at every vital bearing point, LIMA does not stop at putting these wear resisting bearings only where high speed shafts revolve, but in the clutches, drums, cone rollers and other points where friction is commonly found. It costs less in the long run to operate a LIMA.



*Capacities*

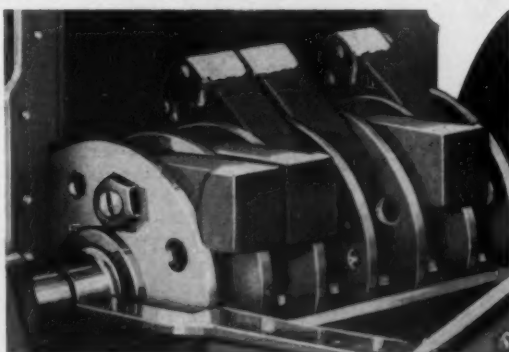
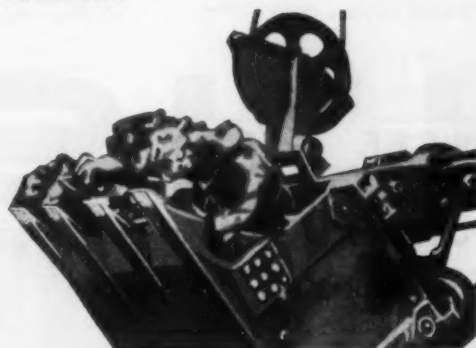
CRANES 13 TONS TO 100 TONS  
SHOVELS ¼ YD. TO 5 YDS. DRAGLINES - VARIABLE

# LIMA

## ATTENTION PLEASE!!

# AGRICULTURAL LIMESTONE PRODUCERS

Would you like to reduce your maintenance costs, increase production and obtain a more uniform sized product EASIER? All three are possible if you will insist on using high impact RESISTO-LOY hard facing on your mill hammers.



Resisto-Loy hardfacing will not chip nor flake-off under severe impact and will break more rock quicker.

Resisto-Loy on power shovel teeth:

- Will prevent excessive wear.
- Make them last longer.
- Dig more aggregate faster.
- Fill easier and quicker.

ISOROD—Extreme impact self-hardening. Electrodes are excellent for build-up before hardfacing your shovel teeth and mill hammers. Deposits are forgeable.

## RESISTO-LOY COMPANY - GRAND RAPIDS 7, MICH.

Write for your copy  
of the  
CATALOG

**KNOX**  
Valves-Couplers-Nipples-Clamps-Menders



KNOX MANUFACTURING CO.  
818 Cherry St. Phila. 7, Pa., U.S.A.  
SINCE 1911 PRODUCERS OF

**KNOX**  
Valves-Couplers-Nipples-Clamps-Menders

## Phosphate Sampling

(Continued from page 138)

tions in rate of discharge off the belt making it impossible to set up a satisfactory sampler at this point. Each car is therefore sampled immediately after loading, in a manner as follows: holes at eight locations are dug, with post hole digger or prospect auger, depending upon the consistency of the particular load, and the entire core taken from each of them as the sample. Each core, which usually fills a 12-qt. bucket is then dumped into a steel drum through a coarse, heavy wire screen fitted to its mouth. The purpose of the screen is two-fold: it breaks up large cemented masses of sand and clay lumps, and stacks the eight cones in layers like griddle cakes, facilitating the subsequent quartering operation. Since the sample is usually very sticky it is impossible to mix it concrete-mixing fashion, so the drum is dumped, preserving the griddle cake layer formation, the layers flattened with a shovel and then quartered. The remainder is again shoveled into buckets and the process of screening through, flattening and quartering repeated until one bucketful remains, which is then dried subsequent to crushing.

The rejects slurry discharging from washer and going to settling ponds for recovery of water is important for its indication of washer performance as explained in a previous article. Therefore at least one operation in the field has arranged to take a continuous sample.

A ½-in. line, tapped into the discharge line of the pump transferring slurry to settling ponds, is run over to a nearby bowl classifier to discharge its contents into the rotating rake compartment. A small can fastened upright to one of the rake arms comes into register with the line discharge once every revolution of the rakes with the result that a small but representative sample is caught per shift or for any convenient period, the flow from the pipe stopping only when the washer stops.

## Analyses

The principal chemical determinations are those for phosphorus, iron, aluminum, silicon, and calcium. Sometimes the alkalis are also determined, but these are made only for the manufacturer of elemental phosphorus and are of no use to the fertilizer manufacturer. For control work the phosphorus determination is almost exclusively used as a criterion of plant performance as well as the value of stock. Analytical procedures conform with those of the A.O.A.C. and are usually mandatory when contracts are let based on grade level premiums and penalties. For phosphorus the method is that in which the ammonium-phosphomolybdate precipitate in excess sodium hydroxide is titrated with standard nitric acid. The accuracy is high, but the time required is almost two hours which nearly nullifies its usefulness for control, in which the getting of quick answers with fair to good accuracy is of paramount importance. To this end the writer has made experiments based on the work of Barclay of Port Adelaide, Australia, who describes the use of potentiometric titration on water soluble phosphates, requiring only six minutes. In applying the method to phosphate rock, the sample is first dissolved by the usual method using hydrochloric acid. The diluted acid salt is adjusted with caustic soda to a pH of 4.5, then titrated to an endpoint of 9.25 pH with a standard calcium hydroxide solution as measured with a low resistance glass electrode portable electrometer. Interference of alumina makes it necessary to standardize against a sample of approximately the same grade range as that under examination. In the high grade range no more standardization has to be done than that for the regular volumetric determination, but on low grade the error is likely to increase. Nevertheless, the accuracy is ample for control work and the entire determination only requires about 22 minutes.

(Continued on page 142)

**BINS**  
**NEFF & FRY**

## SUPER-STAVE-PORTABLE BINS

Build up your storage capacity and automatic handling equipment now. Get set to meet the rush for sand, gravel and cement.

Neff & Fry bins are inexpensive but good for many years' service. Any capacity. Quick erection. Guaranteed. Get catalogue.

THE NEFF & FRY CO., Camden, Ohio





## DIAMOND-BORED RODS

another  
"HIDDEN VALUE"

in all  
**WISCONSIN**  
*Air-Cooled*  
**ENGINES**



Absolute uniformity and close-tolerance fit of all connecting rod bushings are direct results of the unique machine operation illustrated above. Each rod is rigidly locked in precisely the same position, and diamond-pointed bits machine both ends of every rod with uncanny smoothness and perfect mechanical precision. All of this helps to produce a quiet, smooth-running engine, designed and built for heavy-duty service all the way through.

All of this adds up to highly satisfactory end use on your equipment.

Most H.P. per pound



**WISCONSIN MOTOR**  
Corporation  
MILWAUKEE 14, WISCONSIN, U. S. A.  
World's Largest Builders of Heavy-Duty Air-Cooled Engines

**DOUBLE** *Your Truck*  
**CAPACITY**  
... GET AMPLE TRACTION  
OVER THE ROUGHEST GROUND

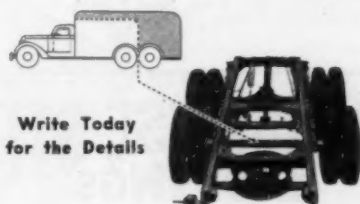
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THE WORLD'S BEST THIRD AXLE

Is Built and Engineered  
to last from One Truck  
to Another.

TRUXMORES have  
been transferred to 4  
and 5 different chassis,  
and after traveling  
300,000 to 400,  
000 miles are still  
going strong!

TRUXMORES carry  
two payloads on one.  
You simply add another  
set of tires,  
wheels, brakes, axle,  
steel beams and frame  
to safely carry and  
stop the load. And  
you save the cost of  
one driver, one motor,  
much gasoline,  
one license, one insurance  
policy, and cut your hauling cost  
per ton nearly in half.



Write Today  
for the Details



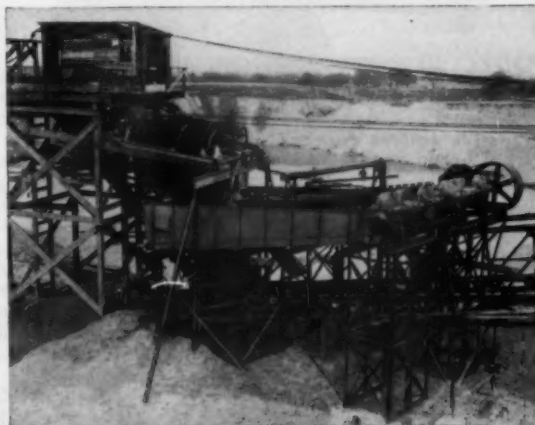
NATIONWIDE SALES & SERVICE  
THRU TRUCKSTELL DISTRIBUTORS

## McLANAHAN

improved

## STEEL LOG WASHERS

Insure Greater Capacity . . . Lower  
Costs . . . Clean Products . . . Constant  
Demand and Higher Prices  
with Less Stripping



Three 30' Heavy Duty Double Logs with McLANahan Drag Washing  
Sand and Gravel in a large Mid-Western plant.

Here are a dozen reasons for  
McLANahan Steel Log Washer Superiority . . .

1. Each electrically welded steel log with welded bases driven separately.
2. Oversize steel log shaft gudgeons.
3. No twisting, sagging, or warping.
4. Improved interchangeable and reversible paddle arrangement.
5. All renewable bronze bush bearings in discharge end.
6. Shafts, bearings, and steel gears held rigidly in safety housing and running in oil.
7. Rear bearings adjustable.
8. Adjustable overflow and discharge spouts.
9. Industrial lubricating fitting.
10. V or flat belt drives.
11. Minimum water requirements.
12. All self-contained in steel box ready to place on foundations.

Descriptive Bulletins On Request

**McLANAHAN & STONE CORPORATION**

Pit, Mine and Quarry Equipment Headquarters  
Since 1835  
HOLLIDAYSBURG, PENNSYLVANIA

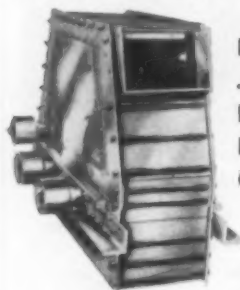
## NEW HOLLAND ADVANCEMENTS



### MODEL 30 FOR GREATER TONNAGES

*In Agstone and the  
Finer Aggregates*

Here is a real volume producer. Special features include adjustable swing hammers with renewable multi-point hammer trips, adjustable breaker plate, tramp iron pockets, and heavy duty roller bearings.



### Model 3030 ... A DOUBLE IMPELLER CRUSHER

The aston-  
ishing effi-  
ciency of  
this new  
crusher re-

duces material from 30 in. to an optional minimum of 80% under one inch in one operation. Handles 100 to 150 tons per hour with as little as 100 hp.



### New Holland HORIZONTAL SCREENS

Require less head room. Permit using as many decks as needed without altering main frame. Operate without cams or eccentrics. Can increase or decrease amplitude of throw in any direction. Can increase or decrease throw of either end. All bearings are sealed and run in oil.

WRITE FOR DETAILS about these three advancements in machinery suited to your plant operations.

**NEW HOLLAND  
MACHINE CO.**

NEW HOLLAND  
PENNSYLVANIA

Fineness of ground rock is measured by washing a weighed quantity through a 200- or 300-mesh screen as the case might be, with a controlled spray of water under a constant head for a definite period of time. The residue on the screen is dried by setting screen and contents on hot plate for a few minutes subsequent to brushing the contents into a weighing bottle. Percent through is then obtained by difference. Size determinations coarser than 200-mesh are made dry using a standard nest of Tyler screens with Ro-Tap.

To determine the solids content of slurries containing very fine solids, a short range, wide scale, hydrometer can be used to obtain quick results. The previously agitated suspension is poured into a narrow cylindrical vessel of proper depth and the apparent specific gravity immediately read. The solid content of slurries containing coarser particles can be estimated with the use of an inexpensive laboratory centrifuge having calibrated sample cups. In most work of this kind around a phosphate plant, however, the samples are many gallons in volume so the time-honored, but tedious, decantation and siphoning must be resorted to.

### Lime Association Starts Agricultural Research

NATIONAL LIME ASSOCIATION, Washington, D. C., has announced through President S. Walter Stauffer that the association will start a new agricultural research program. An Advisory Committee of the association will meet from time to time with representatives of five agricultural experiment stations to help decide upon the program of work and to keep in touch with developments. The first of these meetings will be at Rutgers University on June 6, 1945, and subsequent meetings will be held at the other universities involved in this cooperative program.

It has been decided to finance a five-year research program in cooperation with the Soils Department of the New Jersey Agricultural Ex-

periment Station at Rutgers University to be gotten under way by July 1, 1945. One year later the program will be expanded to include experiment stations in New York, Pennsylvania, Ohio, and Maryland, and arrangements are now being made for the granting of graduate fellowships leading to the Ph.D. degree in all these states.

### Purchase Asbestos Mine

FLINTKOTE Co., East Rutherford, N. J., has announced the purchase of one mining and two manufacturing properties: The Raybestos-Manhattan, Inc., plant at Whippany, N. J.; the Tile-Tex Co., and an asbestos mining property near Thetford Mines, Quebec, Canada. The latter property is to be operated by Flintkote Mines, Ltd., subsidiary of the Flintkote Co., Ltd., of Canada.

### Cement Production

BUREAU OF MINES reports that production of finished portland cement during January, 1945, totaled 6,379,000 bbl. or 1 percent above that of the corresponding month in 1944. The January, 1945, production was considerably greater than demand and approximately 1½ million barrels entered stocks. Shipments from mills during January dropped to 4,873,000 bbl., a decline of 3.4 percent from the mill movement in January, 1944. Mill stocks of finished cement at the end of January totaled 21,369,000 bbl., a decline of 12.5 percent from the stocks of the corresponding month of 1944. However, the January total is 7.6 percent above the December, 1944, figure and thus represents a continuation of the upswing in stocks which began in November, 1944.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of January, 1945, and of January, 1944:

	RATIO (PERCENT) OF PRODUCTION TO CAPACITY				
	Jan. 1945	Jan. 1944	Dec. 1944	Nov. 1944	Oct. 1944
The month...	31.0	30.0	36.0	42.0	45.0
12 months...	37.0	51.0	37.0	38.0	38.0

## MANGANESE STEEL CASTINGS

for  
PULVERIZERS  
CRUSHERS  
ROLLS  
SCREENS



for  
SHOVELS  
DREDGES  
CRANES  
CONVEYORS

**The Frog, Switch & Mfg. Co.**

Established 1891

CARLISLE, PA.

## No Absenteeism on Hendrick Perforated Plate!



Always on the job, Hendrick Perforated Plate saves you time and manpower. Full clearance from top to bottom prevents clogging—assures full time production!

Available in all commercially rolled metals—including abrasion-resistant Hendrick High Carbon, Heat Treated Steel—Hendrick Perforated Plate is accurately punched to your specification in any size or shape of opening—in any gauge of metal. You have only to tell us your needs.

## HENDRICK MANUFACTURING CO.

47 Dundaff St., Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES

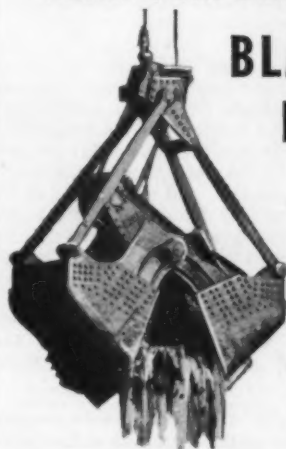
PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types, Mitre Open Steel Flooring, Mitre Shur-Site Treads and Mitre Armorgrids. Light and Heavy Steel Plate Construction.

YOU ALWAYS GET

PEAK PERFORMANCE FROM

## BLAW-KNOX BUCKETS



Every Blaw-Knox bucket is designed for a specific purpose—the greatest output from your crane.

★  
**BLAW-KNOX BUCKETS**  
in over 100 types and sizes are illustrated and described in Catalog 1757... send for your copy today.

**BLAW-KNOX DIVISION**  
of Blaw-Knox Company  
2035 FARMERS BANK BLDG.  
Pittsburgh, Pa.

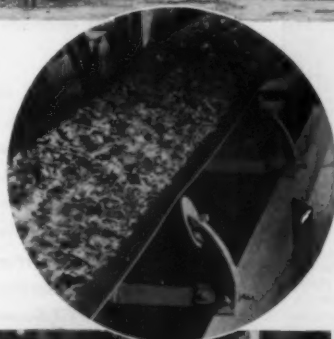
New York • Chicago • Philadelphia  
Birmingham • Washington  
Representatives in Principal Cities

### MAKE 'EM LAST

Bulletin 2004 gives complete instruction on the Care and Maintenance of Clamshell Buckets... copy on request.

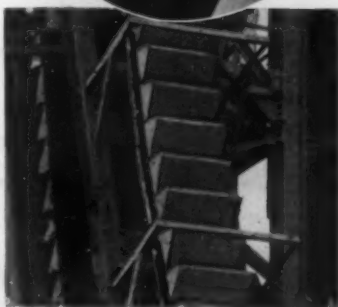


## Give the Tough Jobs to GOODALL Belting!



### CONVEYOR BELTING . . .

"TRIPLE-S" For handling ores, crushed limestone up to 6", wet char and sugar, rough slag, hot materials, etc. "GOOD-ALL": For handling lighter materials such as coal (not run of mine), crushed stone, gravel, salt, shells, ashes, etc.



### ELEVATOR BELTING . . .

"76" BRAND. For hard service on wet or dry materials such as crushed stone, crushed slag, trap rock, etc. "LA CROSSE": For general service on bulk material such as coal, sand, gravel, lime, salt, fertilizer, dry chemicals and finished cement.

### TRANSMISSION BELTING . . .

"POWER KING": Raw edge belting for rock crushers, cement plants and other hard service. Extra heavy construction—33 to 35 oz. silver hard duck. "LA CROSSE": Heavy construction—32 oz. duck. "OSAGE": Light construction 28 oz. duck.



Contact Our Nearest Branch or Main Office for Details

## GOODALL RUBBER COMPANY INCORPORATED



THE GOODALL-WHITEHEAD COMPANIES  
Philadelphia • Trenton • New York • Chicago  
Pittsburgh • Boston

Goodall Rubber Co. of Calif.  
Factory—Trenton, N. J.

Goodall Rubber Co. of Texas  
Established 1870



## Save Labor! Cut Costs!

with SAUERMAN CRESCENT SCRAPERS



### Explanation of Picture—

Above is a Sauerman Crescent scraper cutting deep into hill and hauling gravel to crusher. Bucket is pulled to rear of cut, gathers a heaping load, and carries load to hopper—all in a little over a minute.

Write for Catalog

**A**T gravel and stone crushing plants, in strip mines and wherever there are problems of stockpiling or excavating, Sauerman Crescent scraper buckets daily demonstrate their ability to dig and deliver large tonnages of materials at costs of a few cents a ton.

The secret of "Crescent" efficiency is in the streamline design of this unique bottomless bucket. A Crescent scraper penetrates hard materials with the ease of a plowshare, and requires less line-pull than any other type of scraper to move a given load. Ranging rapidly over a large area, loading and dumping automatically, a Crescent Scraper, operated by a Sauerman improved hoist, is the most productive one-man machine for digging and hauling.

**SAUERMAN BROS., INC.**

530 S. Clinton St.

Chicago 7, Illinois

## BROWNHOIST BUCKETS



The greedy jaws of Brownhoist clamshell buckets speed up material handling in dirt, clay, coal, gravel and ore. Their deep, clean bites practically eliminate hand shoveling. Extra sturdy. Large sheaves reduce rope wear to a minimum.

AVAILABLE IN ROPE-REEVE, POWER-WHEEL AND LINK-TYPE. For facts and prices write to Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.

## OBITUARIES

**EUGENE H. MCEUEN**, supervising engineer of the Chubbuck Lime Co., Los Angeles, Calif., passed away January 17 at South San Francisco, Calif. He was 59 years old. Born in Rockport, Ill., in 1886, Mr. McEuen had over 30 years' experience in the design, erection and operation of lime plants in the Midwest and on the Pacific Coast. He formerly had been with the Marblehead Lime Co., Chicago, Ill., The Valley Lime Co., Lindsay, Calif., and the Auburn Chemical Lime Co., Ltd., Auburn, Calif.

**LESLIE M. HANSEN**, president of the Industrial Silica Corp., Chicago, Ill., died March 18. He was 55 years of age. Mr. Hansen, a native of Michigan, graduated as a chemical engineer from the University of Pennsylvania in 1913. After working as an engineer for the Santa Fe Railroad and for steel foundries in Iowa, he came to Chicago in 1922 as secretary of Frank D. Chase, Inc. In 1941 he was president of the National Industrial Sand Association.

**STEPHEN E. WILLEY**, well known sand and gravel producer, died February 24 in Cincinnati, Ohio. He was 83 years old. Owner and operator of The Willey-Ruckstuhl Co., near Miami, Ohio, Mr. Willey had been in the sand and gravel business since 1903, and was active up to the time of his death. He had a thorough knowledge of the sand and gravel industry and had built several producing plants. While not an engineer, he was often consulted by prospective producers.

**LYOED EARL LUMPKIN**, associated with the Hermitage Gravel Co. and the Arkansas Gravel Co., Little Rock, Ark., died suddenly while on a hunting trip near Bigelow, Ark. He was 47 years old. Mr. Lumpkin, a native of Dixon, Mo., and a graduate of the University of Missouri, formerly was engineer of materials and tests for the Arkansas State Highway Department and later was technical engineer for the Marquette Cement Mfg. Co., Chicago, Ill. He also was associated with Ben M. Hogan & Co., general contractors of Little Rock, Ark.

**LIBRATO LATTANZIO**, vice-president and one of the founders of Lattanzio Bros., sand and gravel producers of Schenectady, N. Y., died recently at the age of 59.

**WILLIAM A. MIDDLETON**, former president of the Lake Shore Sand and Gravel Co., Erie, Penn., died February 9 at his home in Erie.

**ANDREW C. PERKINS**, president of Georgia Iron Works, Augusta, Ga., died February 7.

**WHEN YOU WANT  
Production UP—Costs DOWN**



—you'll find Davenport Better-Built Locomotives the most effective means toward that end. This is a sound tip for those busy post-war days when construction booms and your capacity to produce is really tested. Davenports are the last word in modern dependability. They are superb performers—efficient, lasting and easy to operate. Tell us your needs. We'll gladly submit recommendations without obligation.



Entrust Your Post-War Haulage to Modern Davenports

EXPORT OFFICE **BROWN & SITES** 50 Church St., New York  
Cable Add. "BROSITES"

**DAVENPORT LOCOMOTIVE WORKS**  
A DIVISION OF DAVENPORT BRESLER CORPORATION, DAVENPORT, IOWA



**NO**  
Arching  
Clogging  
Hanging-Up  
•  
**"BRANFORD"**  
PNEUMATIC  
VIBRATORS

"Branford" Vibrators are a highly efficient means of keeping materials flowing freely in Hoppers, Bins, Chutes, Pipes, Screens, Etc. "Branford" Air Vibrators are low in cost, easy to install, economical in operation and maintenance. Only one moving part.

Send equipment specifications—work, for our quotation and full information. Write for Catalogue.

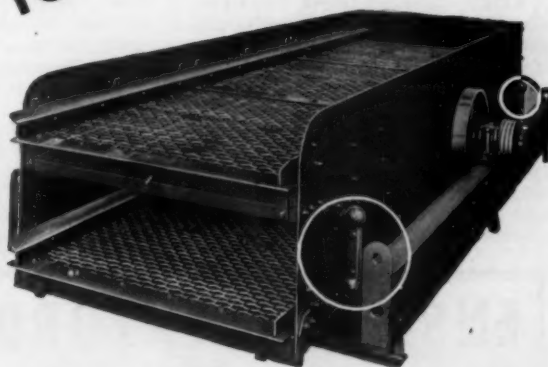
Flow of material regulated by manipulation of Air Valve.

Wide range of sizes and types suitable to any job. Also Vibrators for CONCRETE PLACEMENT.

**NEW HAVEN VIBRATOR CO.**  
145 CHESTNUT ST. NEW HAVEN, CONN.

**From Rip Rap**

**TO FINE LIMESTONE**



**there's a SECO Screen to give  
you MORE TONS PER HOUR**

The big reason why operators are getting increased tonnages with Seco vibrating screens is Seco's sharper whip. This drives materials more thoroughly and more quickly through the meshes, reduces tendency to blind and improves conveying action.

Seco's patented method of mounting the live body to the base frame gives a positive control of the gyrating action. This is the advanced engineering that produces Seco's sharper whip—and distributes it evenly over every inch of screen surface—regardless of the load condition.

For more tons per hour on your screening job consult Seco's screening experts. Write Dept. B today!

**SECO**

**SCREEN EQUIPMENT CO., INC.**  
9 Lafayette Avenue, Buffalo 13, N. Y.

# Financial

## RECENT DIVIDENDS

Arundel Corp. ....	\$ .25	Apr. 2
Canada Cement Co., Ltd., 6½% pfd. ....	1.25	Mar. 20
Canada Crushed Stone Co. ....	.10	Mar. 20
International Minerals & Chem. Corp., pfd. ....	1.00	Mar. 30
Lehigh Portl'd Cement Co. ....	.25	May 1
Lone Star Cement Corp. ....	.37½	Mar. 31
Pacific Coast Aggregates, Inc. ....	.05	Mar. 15
Pacific Portland Cement Co., pfd. ....	1.00	Jan. 31
Pennsylvania Glass Sand Corp. ....	.25	Apr. 1
Pennsylvania Glass Sand Corp., pfd. ....	1.25	Apr. 1
Schumacher Wall Board Corp. ....	.25	Feb. 15
Schumacher Wall Board Corp., pfd. ....	.50	Feb. 15
Southern Phosphate Corp. ....	.10	Mar. 30
Superior Portland Cement Co., \$3.30 A. ....	.82½	Apr. 1
U. S. Gypsum Co. ....	.50	Apr. 2
U. S. Gypsum Co., pfd. ....	1.75	Apr. 2

**KELLEY ISLAND LIME & TRANSPORT Co.,** Cleveland, Ohio, showed a substantial increase in 1944 net earnings to \$163,450 compared with \$93,464 in 1943. This increase in net was made in spite of an increase of \$810,000 in production costs. The balance sheet as of December 31, 1944, showed current assets of \$2,307,856, including \$1,225,419 in cash and U. S. government securities, and current liabilities of \$338,212.

**BASIC REFRACTORIES, INC.,** Cleveland, Ohio, showed a net profit of \$176,967 for the year ended December 31, 1944, as against \$183,222 in 1943.

**BLUE DIAMOND CORPORATION,** Los Angeles, Calif., reported a net income of \$214,245 for the year ended December 31, 1944, which compares with \$190,409 in 1943. Sales in 1944 were \$4,940,973 as compared with \$3,946,833 in 1943.

**GYPSUM, LIME & ALABASTINE, CANADA, LTD.,** Toronto, Ont., showed a net profit of \$239,215 for the year ended November 30, 1944. This compares with \$235,625 for a similar period ended November 30, 1943.

**NEW ENGLAND LIME Co.,** Adams, Mass., had a net income of \$16,611 in 1944 as compared with \$7406 in 1943. Net sales for the twelve months ended December 31, 1944, were \$540,761 as against \$400,474 in 1943.

**LONGHORN PORTLAND CEMENT Co.,** San Antonio, Texas, had a net income of \$161,664 for the year ended December 31, 1944, which compares with \$303,604 for a similar period ended December 31, 1943.

**THE WARNER Co.,** Philadelphia, Penn., had a net income of \$440,072, after taxes, for the year ended December 31, 1944. This compares with \$606,844 for a similar period in 1943.

**LONE STAR CEMENT CORPORATION,** New York, N. Y., showed the following earnings statement for the 12 months ended December 31:

	1944	1943
Sales .....	\$27,973,551	\$29,684,219
Mfg., etc., costs ..	18,933,770	18,225,174
Selling exp., etc. ..	2,774,342	2,830,727
Deprec. & deplet. ..	1,905,103	2,013,834
Operating profit ..	4,360,336	6,614,484
Other income ....	475,156	381,304
Total income ....	4,835,492	6,995,788
Fed. inc. & prof. net, tax .....	\$1,193,000	3,030,000
Other taxes .....	1,184,983	947,804
*Misc. charges ....	453,127	204,068
Net profit .....	2,004,382	2,723,916
Earned per share. ..	\$2.11	\$2.87
No. of shares ....	948,597	948,597

\*Includes provisions for doubtful accounts and contingencies.  
†No provision for excess profits tax necessary.  
‡Subject to audit and adjustment.

Although domestic sales of cement continued to decline, the company has maintained total sales volume in 1944 close to 1943 figures through exports and the output of its five plants in Central and South America. Argen-

(Continued on page 148)

## ENSIGN-BICKFORD

*Safety Fuse*

## PRIMACORD-BICKFORD

*Detonating Fuse*

THE ENSIGN-BICKFORD COMPANY

Simsbury - Connecticut



## WOVEN WIRE SCREENS

ACCURATE • DURABLE • ECONOMICAL

The reliability of T.C. Alloy Screens has carried them into all parts of the world. Made in Standard and Special Weaves, with Square or Oblong Openings—from 10 mesh, .035" wire on up. Write today for Catalog No. 42.

TWIN CITY IRON & WIRE CO.

35 W. WATER STREET • ST. PAUL 1, MINNESOTA

## MARKLEY-CARTER

*Portable*

## DUST COLLECTORS

*"Collects and Controls"*

*What  
YOU SHOULD  
KNOW ABOUT*

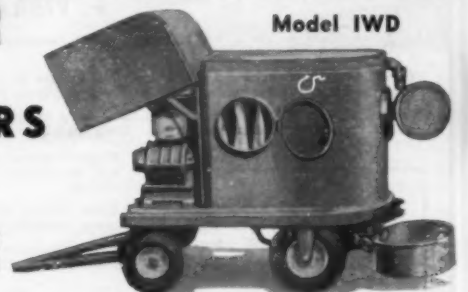
1 Portable units operate through powerful air stream by an effective double separation principle. No dust escapes into the air. Reduces SILICOSIS hazard to safe hygienic limit.

2 When applied to rock drills, SPEEDS UP DRILLING TO 33 PERCENT. Drill steel cuts into fresh rock unimpeded by dust or chips. PROLONGS LIFE OF DRILL STEEL. REDUCES SHARPENING COSTS.

3 Quick detachable hood permits easy inspection of hole and changing drill steel without interference from hood.

4 When applied as industrial unit, collects dust accumulations that are costly and apt to be a hazard both to men and equipment. Keeps your plant, motors and machinery free from harmful dusts.

5 Equipped with Markley-Carter disposal container which permits continuous collection and disposal without closing down the system.



Model IWD

Write for Bulletin 4402 which describes in detail the advantages of using MARKLEY-CARTER DUST COLLECTOR in your quarry and plant.

## RALPH B. CARTER COMPANY

192 ATLANTIC ST., HACKENSACK, N. J. 53 PARK PL., N. Y. 7, N. Y.





## "PENNSYLVANIA" REVERSIBLE HAMMERMILL

This 2-way REVERSIBLE has largely replaced the older 1-way "Pennsylvania" design.

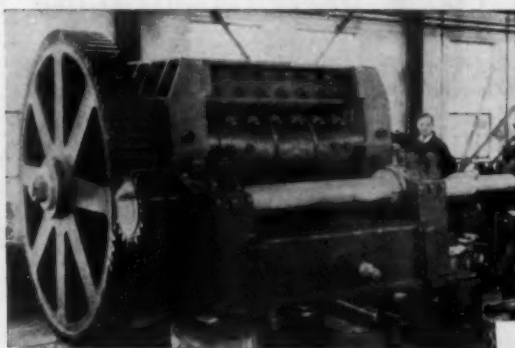
From an operating standpoint STEELBUILT REVERSIBLES are far ahead.

If interested write for information.



1706 LIBERTY TRUST BLDG., PHILADELPHIA, PA.  
New York, Pittsburgh, Chicago, Los Angeles, Birmingham

Associated with Fraser & Chalmers Engineering Works, London, England



## "PENNSYLVANIA" SINGLE ROLL

For Primary and Secondary reductions, the Single Roll has many natural operating advantages over other well known types.

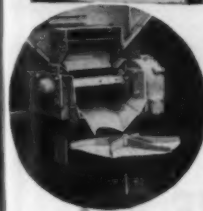
Oversize feed Hoppers mean less Hopper jams.

Takes wet or frozen feeds. Safety Shearpin relief. Great accessibility of wear parts. Powerfully STEEL-BUILT in capacities 5 to 1000 T.P.H.

Write for Bulletin.

## FOR PERFECT SPREADS USE A BAUGHMAN

The machine that made LIME popular!



**New, Wide Chain, K Model.** Precision Timken roller and ball bearings throughout. Hardened and annealed cut steel gears — only 2 used in body and 2 in spreader. 24-inch gate for rapid discharge of crushed stone (any size), coal, grain, cinders, etc. Large body capacity.

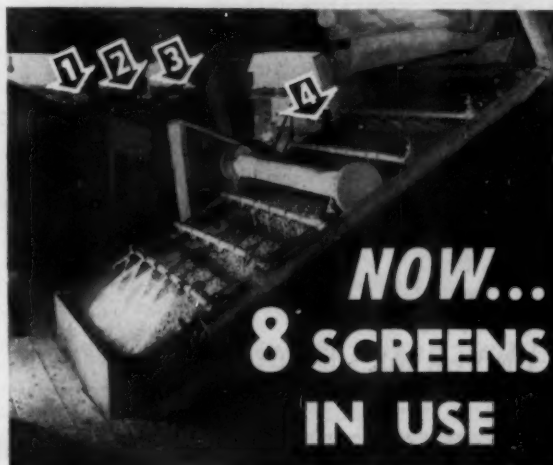
MANY NEW MODELS — 5 to 20 TONS CAPACITY

Manufacturers of the famous "Hi-Speed" line of Self-Unloading Equipment.

Model K and I, Chain Conveyor Type	Special Low Boy Tractor Spreader
Model H and D, Chain Conveyor Type	Model P, Flat Bed Type
Model E, Belt Conveyor Type	Model J, Transfer Type
Model C, Cinder and Chip Spreader	Model L, Car Unloader
Model N, Dump Body LIME Spreader	Model M, Car Unloader

Ask for recommendations—we have a reliable distributor near you.

**BAUGHMAN MANUFACTURING CO., Inc.**  
Factories • Jerseyville, Illinois



● Satisfactory service of the first 4 screens resulted in the installation of 4 additional screens—making 8 in use at this plant washing phosphate rock. If your requirements call for sizing, washing, dewatering or recovering all kinds of wet or dry materials, let Link-Belt Screens do the job. Made in a number of standard sizes. Write for Books Nos. 1762 and 1777.

**LINK-BELT COMPANY**, 2045 W. Hunting Park Ave., Philadelphia 40; 300 W. Pershing Road, Chicago 9. Offices in Principal Cities.

**LINK-BELT Vibrating SCREENS**

## ★ Places where HARD-FACING Saves Money!



1. Shovel Teeth  
5. Crusher Jaws and Cheek Plates



3. Rock Drill Bits  
4. Sprocket Teeth  
6. Tractor Treads and Rollers

SEE THOSE SHOVEL TEETH, sheaves, rock drill bits, sprocket teeth, crusher jaws, tractor treads and rollers? All are typical equipment parts that can be made extra-resistant to wear by Coast Metals Hard-Facing.

All that is necessary is to weld the Coast Metals overlay or coating to the steel or iron surface to be protected. Use either the electric arc or the gas torch process. Application is easy, and conforms to simple welding techniques. You can weld Coast Metals alloys to all ferrous metals, including manganese steel, alloy steel, cast iron and chilled iron.

Coast Metals Hard-Facing eliminates the need

for frequent repairs or replacements also of pump shell liners, hammers, plows, shafts, bulldozers, extruding screws, pump runners, cement pump screws, paddle washers, rolls, dredge pump or other parts. Our new pamphlet, "How to Make Your Equipment Last Longer" goes into full detail. Write for your free copy today.

### COAST METALS, INC.

Plant and General Offices:  
1232 Camden Ave., S.W. Canton 6, Ohio  
Executive Offices:  
2 West 45th Street, New York 19, N. Y.

# COAST METALS

**hard-facing  
weld rods**

MAKE YOUR EQUIPMENT LAST LONGER

## UNIVERSAL SCREENS

and

### "UNIVIBE" RIDDLES

Efficiency, economy, greater capacity . . . these facts demand your interest in the Improved Universal Vibrators. Since 1919, the BEST in screening equipment at the LOWEST COST.

**GET NEW CATALOG**

You should have a copy of the new 22-page catalog on Screens and Screening. Just ask for Catalog No. 167.

UNIVERSAL VIBRATING SCREEN CO.

RACINE - WISCONSIN

# HAYWARD BUCKETS

**USE RIGHT BUCKET  
FOR THE JOB**

Hayward makes all four-clam shell dragline, electric motor, orange peel. A Hayward recommendation is unprejudiced.

**THE HAYWARD COMPANY**  
282-284 Fulton Street  
New York, N. Y.



## "WIRE SCREENS? SURE BILL—BUY 'CLEVELAND'-WE DO!"

Tough, Durable, Accurate Wire Screens for Vibrators or Rotary Jackets  
*Cleveland is the "Buy" Word of Quality*

### THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 E. 78TH STREET

CLEVELAND, OHIO

(Continued from page 146)

tine plant output was curtailed due to fuel oil scarcity.

MONSANTO CHEMICAL Co., St. Louis, Mo., is planning heavy production of aluminum metaphosphate in the post-war period. This product, which is used in glass manufacture, results in a product which transmits a much greater amount of ultra-violet light, improved weather resistance, and resistance to certain acids.

KENTUCKY STONE Co., INC., Louisville, Ky., has presented the following income account for the years ended April 30:

	1944	1943
Net sales . . . . .	\$1,139,017	\$1,259,747
Costs & expenses . . . . .	884,025	905,773
Depr. & depl., etc. . . . .	97,855	98,329
Operating profit . . . . .	157,137	255,582
Inc. bond interest . . . . .	6,998	8,198
Income taxes . . . . .	90,557	173,171
Net income . . . . .	59,582	74,212
Dividends . . . . .	11,825	
Surplus for year . . . . .	47,957	74,212
Prev. earn. surp. . . . .	214,529	177,197
Debits, net . . . . .	24,793	36,881
*Times chg., 4-30 . . . . .	22.45	31.81
Earn. surp. 4-30 . . . . .	237,693	214,529
Earned per share . . . . .	\$7.69	\$9.58
No. of shares . . . . .	7,750	7,750

\* Before income taxes.

CONSOLIDATED ROCK PRODUCTS Co., Los Angeles, Calif., has completed reorganization of the company. A payment of \$105 will be made with

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98,329  
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177,197  
36,881  
31,81  
214,529  
\$9.58  
7,750

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each new \$1000 first mortgage, 3 percent and 2 percent non-cumulative income interest bond exchanged for the old 6 percent mortgage bonds in default. Old preferred stock will receive new common at the rate of 1.236 shares for each old share. The old common will not participate.

NORTH AMERICAN CEMENT CORPORATION, New York, N. Y., showed a net loss of \$432,625 for the year ended December 31, 1944, as against a loss of \$400,256 for 1943.

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., presented the following income account for the years ended December 31:

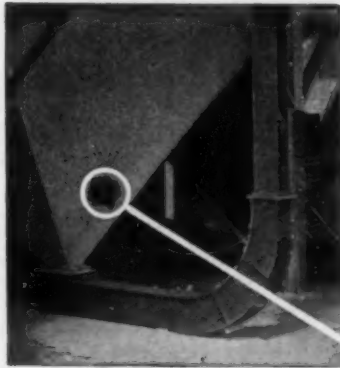
	1944	1943
Sales revenue	\$6,081,540	\$6,029,481
Cost of sales	4,850,195	4,825,047
Selling, etc., exp.	469,543	463,204
Depreciation	38,814	40,391
Operating profit	231,078	239,761
Other income	491,910	461,078
Total income	72,730	100,838
Interest	564,640	561,716
Other deductions	499	1,322
Income tax	5,182	11,962
Operating, etc. res.	220,896	219,703
Net income	50,000	
Dividends	288,063	328,729
	166,714	166,717

PENNSYLVANIA-DIXIE CEMENT CORPORATION, New York, N. Y., showed a net loss of \$486,082 for the year ended December 31, 1944. This compares with a net profit of \$533,101 for the year ended December 31, 1943. Net sales in 1944 were \$4,897,739 as against \$7,505,210 in 1943.

## SYNTRON

### ELECTRIC VIBRATORS

MAKE SAND, GRAVEL, ROCK, ETC.,  
FLOW FREELY THRU BINS, HOPPERS & CHUTES



3600 powerful "Electronic-Controlled" vibrations per minute, break down arching and plugging—without damage to prime equipment.

Eliminate pounding and sledging.

SAVE—  
TIME, MONEY  
AND LABOR

8 Models, each with rheostat control of power—from a little 4 lb. size up to big 500 lb. models, with capacities of from 1 cu. ft. hoppers up to big 100 ton bins. Operate from 110, 220, or 440 volt AC current.

### SYNTRON COMPANY

450 LEXINGTON AVE.

HOME CITY, PA.

## ONE OR A THOUSAND . . .



### LET US CUT THEM FOR YOU

As specialists in Gear, Sprocket and Rack cutting to customer's specifications, we offer you the finest in engineering skill and production accuracy. Send blue prints for estimates. Write for our new Catalog and Engineering Handbook.

# "Industrial"

Cut Gears • Sprockets • Racks

### INDUSTRIAL GEAR MFG. CO.

4544 VAN BUREN STREET CHICAGO 24, ILLINOIS

BELT LACING  
and FASTENERS  
for transmission  
and  
conveyor belts



"JUST A HAMMER TO APPLY IT"

## ALLIGATOR

Trade Mark Reg. U. S. Pat. Office

### STEEL BELT LACING

World famed in general service for strength and long life. A flexible steel-hinged joint, smooth on both sides. 12 sizes. Made in

steel, "Monel Metal" and non-magnetic alloys. Long lengths supplied if needed. Bulletin A-60 gives complete details.

## FLEXCO HD

### BELT FASTENERS AND RIP PLATES

For conveyor and elevator belts of all thicknesses, makes a tight butt joint of great strength and durability. Compresses belt ends between toothed cupped plates. Templates and FLEXCO Clips speed application. 6 sizes. Made in steel, "Monel Metal", non-

magnetic and abrasion resisting alloys.

By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

Sold by supply houses everywhere



"CONVEYOR BELTS EASILY FASTENED"

FLEXIBLE STEEL  
LACING CO.

4684 Lexington St.  
Chicago, Ill.





## MONARCH Whyte Strand PREformed WIRE ROPE

made to meet the needs of  
**ROCK PRODUCTS OPERATORS**

- Made from selected steels
- Internally lubricated
- **PRE**formed
- Made by craftsmen with years of experience

... the **CORRECT** Rope for your equipment

### ASK FOR MACWHYTE CATALOG

170 pages of information. Please request it on your company letterhead from any Macwhyte Wire Rope Distributor or from:

#### MACWHYTE COMPANY

2949 Fourteenth Ave., Kenosha, Wis.  
MILL DEPOTS: New York, Pittsburgh, Chicago  
Et. Worth, Portland, Seattle, San Francisco  
Distributors throughout the U. S. A.

### Manufacturers' News

Wickwire Spencer Steel Co., New York, N. Y., has announced the election of A. G. Bussmann as vice-president in charge of sales, with headquarters in New York.

American Hoist & Derrick Co., St. Paul, Minn., has elected the following officers: Frederic Crosby, chairman of the board; Harold O. Washburn, president; Rolf E. Ljungkull, vice-president of engineering; Donald B. Botkin, vice-president of manufacturing; Stanley M. Hunter, vice-president of sales; James F. Bishop, secretary and assistant treasurer; and Robert J. Henry, assistant secretary.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has elected John Howard Collier a director of the company, to fill the vacancy left by the resignation of Capt. Lester Armour, who is in the Navy. Mr. Collier is president of the Crane Co., Chicago, Ill.

St. Regis Paper Co., New York, N. Y., announces that Burton A. Ford has resigned from the company to become general manager of The Thos. Phillips Co., Akron, Ohio. John F. Gruber will succeed him as manager of the Southeastern division and J. Wilbur Andrews will be assistant manager.

MacWhyte Co., Kenosha, Wis., has announced the appointment of R. P. Tyler as general sales manager. Mr. Tyler formerly was sales manager for A. Leschen & Sons Rope Co., and prior to 1940 was associated with John A. Roebbling's Sons Co. H. E. Sawyer, formerly general sales manager, as well as vice-president and treasurer, will continue as vice-president and comptroller.

The Lincoln Electric Co., Cleveland, Ohio, has appointed W. R. Persons assistant sales manager. He will act as assistant to C. M. Taylor, vice-president and general sales manager.

**YOU CAN  
DEPEND  
ON...**

**MAXIMUM  
SCREENING  
EFFICIENCY**

with  
*Perforated*

**METAL  
SCREENS**

by  
**HARRINGTON & KING**

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PERFORATING CO.**

5650 Fillmore St., Chicago 44, Illinois  
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**HAMMOND  
MULTI-WALL PAPER BAGS**

Sewn and Pasted  
Open Mouth and  
Valve Paper Bags.  
Your Inquiries Invited.  
**WRITE TODAY!**

**HAMMOND BAG & PAPER CO.**  
Paper Mill and Bag Factory, WILLSBURG, W. VA.

**PERFORATED METAL  
SAND AND GRAVEL SCREENS**

Manufactured exactly to your specifications  
Any size or style screen, in thickness of steel  
wanted with any size perforation desired.  
We can promptly duplicate your present screens at lowest prices

**CHICAGO PERFORATING CO.**  
2437 West 24th Place  
CHICAGO, ILLINOIS  
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**WILFLEY  
centrifugal SAND PUMPS**

for Slurries, Sand Tailings,  
Slimes, Acid Sludges

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Continuous operation  
without attention for  
long periods. Stuffing  
box, stuffing, gland  
water ALL eliminated.  
Close clearances main-  
tained by easy slippage  
seal adjustment. Heavy  
pumping parts of material best suited for YOUR particu-  
lar problem. Complete engineering service. Prompt ship-  
ment of parts. The most efficient and economical pump  
you can buy. Write for Complete Catalog.

**A. R. WILFLEY & SONS, Inc.** Denver, Colo., U. S. A.  
NEW YORK OFFICE: 1775 BROADWAY

**FIRST ...  
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NOW ...  
LARGEST INDIVIDUAL PAID MAIL CIRCULATION  
ALWAYS ...  
EDITORIAL LEADERSHIP**

Three distinctions that help  
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Backed by the Facts  
**THE INDUSTRY'S  
RECOGNIZED AUTHORITY**  
309 W. JACKSON BLVD.  
CHICAGO

**ROCK  
PRODUCTS**

Worthington Pump & Machinery Corp., Harrison, N. J., has acquired the Ransome Machinery Company line of concrete machinery. C. F. Oechale, Worthington's assistant vice-president, will be in charge of the Worthington-Ransome Construction Equipment Sales Organization, with headquarters at Holyoke, Mass. He will be assisted by W. F. Lockhardt, sales manager of Ransome Machinery Co., Dunellen, N. J., and W. J. Fleming, field sales manager, Holyoke, Mass.

R. G. LeTourneau, Inc., Peoria, Ill., has announced the promotion of M. E. "Cap" Miller from district representative to Central sales manager, with offices in Peoria, Ill. Mr. Miller succeeds Howard L. Stilley who has left to become manager of the Soule's Equipment Co., northern California distributor for R. G. LeTourneau, Inc., with offices in Oakland, Calif. Mr. Miller joined the company in 1934 at its Western office, Stockton, Calif., where he served as district representative for domestic sales in eastern Canada. Between 1937 and 1940 he had headquarters in London, England, and introduced the LeTourneau earth-moving line to many European countries. Since returning from Europe, he has served as district representative in the South and southwestern states.



M. E. Miller

Hercules Powder Co., Wilmington, Del., announces that William F. McCandlish, explosives salesman, who was captured by the Japs in Manila in 1942 while on business trip to the Philippines, and interned in a prisoners' camp, was among those Americans freed when U. S. troops captured the Los Banos prison camp.

Claude B. Schneible Co., Detroit, Mich., manufacturers of a complete line of equipment for dust, fume and odor control, announces the appointment of John C. Somers, Industrial Products Engineering Co., 1 Hunter St., Long Island City, N. Y., as its representative in the New York territory, including the states of Connecticut, New Jersey and New York.

Mack Trucks, Inc., New York, N. Y., has appointed P. J. Degnon manager of the New England division, with headquarters in Boston, Mass. Mr. Degnon, who is vice-president of Mack Motor Truck Co., replaces W. A. Maynard who has retired after 25 years of active service with the company in New England.

Cummins Engine Co., Inc., Columbus, Ind., has appointed J. H. Patterson manager of the Cummins Diesel Export Corp., New York, N. Y.

# NOT ONE FAILURE in a Million!



... that's a pretty good record but it is the one established by our chrome-nickel alloy ROPE SOCKETS.



Yes, we have been making them for 36 years without a single recorded failure.



Take a lesson from experience, and specify ... EVANSTEEL Rope Sockets. They are stronger, lighter, and cost less.

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EVANSTEEL  
Bulletin

CHICAGO STEEL FOUNDRY COMPANY

KEDZIE AVE & 37TH ST.

PYRASTEEL CHICAGO 32, ILL. EVANSTEEL

for high temperatures. Makers of Alloy Steel for 32 Years for strength



FEEDOWEIGHT

automatically feeds and weighs material to suit your plant requirements.

WEIGHTOMETER constant, automatic, accurate, and low-cost weight record of materials in transit.

**For ACCURACY**  
in Weighing, Feeding, Proportioning.

The uses of Merrick Automatic Continuous Weighing and Feeding Machines are varied. Their accuracy is unexcelled.

Send us an outline of your requirements.

Merrick Scale Mfg. Co.  
Passaic, New Jersey

# SUPER- PERFORMANCE

Like that of the B-29, Owen superiority is based upon a thorough knowledge of the problem, expert designing and precision manufacturing from the most appropriate materials available.

The OWEN BUCKET Co.

8040 Brookwater Avenue, Cleveland, Ohio

Branches New York Philadelphia Chicago Berkeley, Cal.

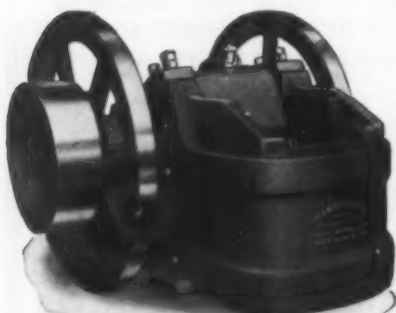
# OWEN BUCKETS

A MOUTHFUL  
AT EVERY BITE

# FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service



**EARLE C. BACON, Inc.**

17 John St., New York, N. Y.

American Chain & Cable Co., Inc., Bridgeport, Conn., has announced the appointment of Alton Parker Hall as general manager of sales, with headquarters at 230 Park Ave., New York, N. Y.

Wickwire Spencer Steel Co., New York, N. Y., announces that Henry Davis formerly in the sales department of the hardware division, will be in charge of the company's newly formed Market Research Department, with headquarters at 500 Fifth Ave., New York, N. Y.

Chain Belt Co., Milwaukee, Wis., announces the appointment of Martin Machinery & Supply Co., 700 Dale Ave., Knoxville, Tenn., as distributors of Rex construction machinery in the Knoxville area. Karl R. Martin will be head of the firm. Associated with him are John Hay, L. C. Biggs, Houston Brown, and Karl R. Martin, Sr. The Martin Machinery & Supply Co. also represents Austin-Western; Blockner pumps; C. H. & E. Mfg. Co.; Dewalt; Eagle Iron Works; Independent Pneumatic Tool Co.; LeRol compressors; Lima Locomotive; Linn Mfg. Co., and Republic Rubber Co.

The Euclid Road Machinery Co., Cleveland, Ohio, has announced the appointment of W. W. (Bud) Paape as sales representative in Ohio and adjacent states.

The Foxboro Co., Foxboro, Mass., has appointed William A. Rock, resident engineer in the Corpus Christi, Texas, area, under the direction of the Houston office. James M. Tuttle has joined the staff of engineers attached to the Pittsburgh office.

Gardner-Denver Co., Denver, Colo., has established the main office of its export department in New York, N. Y. It was formerly in Quincy, Ill. E. P. Schaefer, executive vice-president of the company, announced that increased interest in construction equipment in foreign markets, particularly in Latin America, has made necessary the expansion of its export sales and activities. G. V. Leece,

vice-president in charge of the entire export division, confirmed this view of the export situation.

International Paper Co., Allentown, Penn., announces that J. L. Fearing, Jr., district sales manager in charge of the sale of multiwall shipping sacks, has resigned from the company. Mr. Fearing joined the International Paper Co. in 1928 and made a survey of the company's coal properties in Newfoundland and oil properties in Alabama, Arkansas and Louisiana. In 1934 he became New York office manager for the company's subsidiary, the International Paper Products Co. He became St. Louis district sales manager in 1938 and moved to Allentown a year later, with headquarters at his home.

Davey Compressor Co., Kent, Ohio, announces the appointment of three new dealers: Wallace R. McKinney, Jr., 12 South Franklin St., Mobile, Ala., for southern counties of Alabama and western Florida counties around Pensacola; Murray Machinery Co., Sales Division, Inc., 169 State St., Augusta, Me., headed by James A. Murray, president, and Ralph Cole, vice-president, covering the state of Maine and New Hampshire; and Ohio Muf-L-Cote Co., 71 S. Broadway, Akron, Ohio, will handle the industrial compressor line in the Akron-Canton-Massillon areas.

## Army-Navy Awards

General Excavator Co., Marion, Ohio, has been awarded the Army-Navy "E" flag for four years' production of critically needed excavating equipment for war construction and war production in the United States and abroad.

Koehring Co., Milwaukee, Wis., has received for the third time the Army-Navy Production Award for high achievement in the production of war material. This third citation adds a second white star to the company's "E" flag.

From the **SMALLEST** to the **LARGEST TONNAGES**

## TYLER-NIAGARA SCREENS

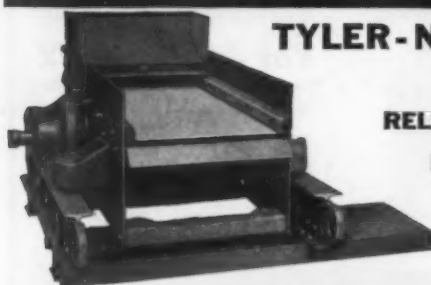
are

**RELIABLE**

**HIGH CAPACITY**

**EFFICIENT**

**ECONOMICAL**



2' x 4' Type 100  
Tyler-Niagara  
Screen



8' x 14' Type 900  
Tyler-Niagara Screen

**THE W. S. TYLER COMPANY, Cleveland 14, Ohio**



**PLYMOUTH LOCOMOTIVES**

• FROM 2½ TO 70 TONS •

**PLYMOUTH LOCOMOTIVE WORKS**

Division of The Fate-Root-Heath Co. • PLYMOUTH, OHIO, U. S. A.

## DENVER "SUB-A" FLOTATION CELLS

Flotation is slowly being applied to beneficiate and concentrate various products in the chemical field which cannot be obtained by other methods. The Denver "Sub-A" is standard the world over because it has a number of exclusive advantages. Bulletin No. F11-B.



NEW YORK CITY, NEW YORK, 10 Church St. CHICAGO, 1001, 89 W. Washington St. SALT LAKE CITY, UTAH, 730 Westgate Bldg. TORONTO, ONTARIO, 42 Richmond St. W. MEXICO, 8 F. California Avenue, Calle 14th No. 7. MIDDLSEX, ENG. 1912, Market Rd. S. Warran. RICHMOND, VIRGINIA, 114 Victoria Street. JOHANNESBURG, S. AFRICA, 4 Victoria Road.

**DENVER EQUIPMENT COMPANY, 1400 17th St., Denver, Colorado**



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Single insertion rate \$5 per column inch. Larger insertions accepted at lower rates; request classified rate card. Terms: Cash with order except for contract advertisers who are

billed monthly at contract rates. POSITIONS WANTED and POSITIONS VACANT (not displayed ads) \$1 a column inch per insertion; cash with order.

## SHOVELS—DRAGLINES

F & H Model 1400 Electric Dragline, 110' boom, 4 yard bucket. Rebuilt.

52-B Bucyrus-Erie Electric Combination 2½ yard shovel and dragline with 70' boom—2½ yard bucket. Rebuilt.

K-480 Link Belt Dragline, 75' boom and 2 yard bucket. 7x7 Hesselman oil engine. Rebuilt.

F & H Model 1250 Electric Shovel, 30'6" boom, 18'6" stick. 2½ yard dipper—4 years old.

Marion Model 37—1½ yard Steam Shovel. New boiler. 32' boom, 22' dipper stick.

¾ Yard Osgood Commander gas shovel. Rebuilt.

1½ yard Osgood Diesel Combination Shovel and Dragline, General Motors diesel engine, 1½ yard dipper, 60' dragline boom, 1½ yard dragline bucket. Completely rebuilt and guaranteed.

**Frank Swabb Equipment Co.**

HAZLETON, PA.

Telephone 3906

¾ Yd. B. & H. Shovel, model 206, with Waukesha Engine  
50x24 Champion Jaw Crusher  
36x24 Farrel Jaw Crusher  
36x18 Farrel Jaw Crusher  
24x12 Champion Jaw Crusher  
19x8 Climax Jaw Crusher  
16x8 I. C. Jaw Crusher on wheels  
13A Telumith Gyratory Crusher  
No. 37 Kennedy Reduction Crusher with synchronous motor built in Byrdwell  
3—14'x30" Lewis Foundry & Machine Co. Worm Washers  
3'x12' Symons double deck Screen  
4'x12' Telumith double deck Screen  
5'x10' Niagara single deck Screen  
5'x24' positive drive revolving screen  
5'x24' trunnion drive revolving screen  
4'x18' Telumith revolving Screen  
3'x16' Acme revolving Screen with trunnion drive  
Double drum Nova Hoist with 50 HP Nova 4 cylinder gasoline engine—direct connected  
Barber Greene Bucket Loader  
115' center x 30' conveyor  
120' center x 24' conveyor  
92' center x 18' conveyor

**FRANK A. KREMSER & SONS, INC.**

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## DIESELS

**ROBERT SCHOONMAKER**  
Port Washington, Long Island, N.Y.  
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## READY MIX TRUCKS

6—1½ Yd. Model 3215. Practically New, Concrete Transport Mixer's Co. Open top Mixers with power take off.

2—1½ Yd. Blaw Knox Mixers, Horizontal Drum Type.

All, except one, mounted on 1940 Ford Chassis, Tires newly retreads, 34x7-10 ply Dual Rear, 32x6-10 ply front. Two speed Axle. Overload springs and Reinforced frame.

Price—"AS IS"—\$1637.00 Each, F.O.B. Memphis, Tenn.

## FISCHER LIME & CEMENT CO.

Memphis, Tennessee

## CRUSHERS

GYRATORY: 42" Gates K. 36" Superior McCully (like new), 36" Superior McCully Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.). Telumith Nos. 4, 5, 6, 8C, 9 & 10. Also many Austin, Kennedy and Traylor, many sizes.

JAW TYPE: Traylor 60x24, 48x20, 42x18, 36x12, Superior 64x26 & 24x36, Buchanan 30x12, Farrel 60x24, 30x26, 18x36, 12x24, Good Roads 10x8, Acme 24x10, Misc. 7x12, 8x10, 8x20, 8x24, 12x24, 24x36, 15x36.

REDUC. TYPE: Kennedy Nos. 25, 37 & 48, Telumith 3-F & 40, Traylor 30" T2, 5", 10", 12", Super. McCully 6"10", Newhouse 5, 7, & 10", Symons Cone & Disc T2, 2" to 4".

ROLLS: Allis-C. 12½x12, 36x10, 46x15, 54x24 & 72x36, Fairmount 36x36 & Jeffrey 34x24 to 36x54 single roll, Cornish 36x15 & 42x10, Etc.

HAMMERMILLS: Williams No. 1, 2, 3, 4, 5, & 9, Jeffrey 36x18 & 36x42, Day Nos. 30 & 40, Etc.

MILLS: Kennedy Ball 4x8, 5x6 & 5x8, Marcy 8x6 & 10x8, Hardinge 6'x3', 8'x30" & 6'x20", Misc. Tube Mills 5' & 6'x22", Sturtevant Ring Roll, Raymond, Kent, Fuller Lehigh, Etc.

CRUSHING PLANTS: No. 68 Diamond No. 22 Pioneer 82x24, 18x30 Good Roads, 9x40 Austin-Western, 9x36 C.R.

## MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Bolters, Cableways, Cans, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kilns, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slicklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

ALEXANDER T. McLEOD

7229 Rogers Avenue CHICAGO (45)

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from 5 Warehouses

**L. B. FOSTER COMPANY**

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## New—RAILS—Relaying ALL SECTIONS

Also contractors' equipment, "V" shaped and Western cars, 24 and 36-in. gauge, portable track, gas locom, frogs and switches. Attractive prices quoted. Wire, write or telephone for quotations.

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Park Bldg. 8112 Bldg. Pittsburg, Pennsylvania Rose, Nevada  
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SCRAPERS (2)—Continental two-wheel type, 5-yard capacity, hydraulic, controlled, complete with pumps and controls; in good condition each.....\$1250.00

SCRAPER—LeTourneau Model "FIP", 14.3 truck capacity; mounted on four 1800x24 pneumatic tires.....4695.00

CRAWLER WAGON—LeTourneau Model 50 cu. yd. hydraulic, slide dump, rock type, with pump for tractor.....900.00

TRACTOR—International Model TD40 Diesel, crawler type.....1000.00

TANDEM ROLLER—Buffalo-Springfield, 3-ton, two-wheel, four-cylinder, gasoline engine, power steer; good running condition.....1675.00

ROAD ROLLER—Galion 10-ton, three-wheel four-cylinder gasoline engine; equipped with air operated scraper; a good roller.....2395.00

ROAD ROLLER—Huber 10-ton, late type, serial No. T2459, three-wheel six-cylinder Buick gasoline engine; price rebuilt.....3995.00

PORTABLE PATCH ROLLER—Galion 5-7 ton capacity, late type, has truck hitch and pneumatic tires for towing; gasoline engine power; good condition.....1000.00

ROAD ROOPER—LeTourneau 3-tooth, Model 12, heavy duty, cable control; weighs 7500 pounds; rebuilt.....1175.00

REDUCTION CRUSHERS (2)—Traylor type "TV" size 1' 8", complete with drive pulley, each.....1670.00

AIR COMPRESSOR—Loroi Model PC210, portable gasoline power, 210 cu. ft. mounted on four steel wheels.....1500.00

WAGON DRILL—Cleveland long boom type for 10 ft. steel change, pneumatic tired wheels; rebuilt and guaranteed.....1275.00

STATIONARY COMPRESSOR—Gardner-Denver 12x12 horizontal single stage, 450 cu. ft. displacement with air receiver.....600.00

VIBRATING SCREEN—new Seco, heavy duty, type HS, Model 238, double deck, 3' x 8' complete with new 7½ HP electric motor and V-belt drive; priority required.....1825.00

ROLL CRUSHER—New Holland, 10" x 16".....850.00

CRUSHER—Cedar Rapids jaw type, roller bearing, 10x36, late type, rebuilt and guaranteed.....3500.00

PUMP—Flex, self-priming, centrifugal 4", with four-cylinder Lerol engine, two wheels; good condition.....395.00

POWER UNIT—Continental six-cylinder gasoline, Model P-98, enclosed clutch, 75 HP at 1750 R.P.M.....995.00

ROCK SPREADERS (2)—Jaeger Model AJS, "Easy Pull", adjustable 8 to 11 ft., will spread 1" to 10" deep, each.....395.00

## ROY-C-WHAYNE SUPPLY COMPANY

800 W. Main St. Webask 1375  
Louisville 2, Ky.

10 ton Plymouth std. ga. gas locomotives. New 1942.

15 ton Whitcomb std. or 36" diesel locomotives. New 1942.

300 HP McIntosh Seymour Diesel Generator set, 80 cycles, 2300 volts. Heavy duty. Full equipment.

4¼ ft. Symons Cone Crusher. Coarse bowl. Standard head.

2 yd. Williams Hercules heavy duty digging Clamshell.

35 HP Clyde 2 drum Gasoline Hoist & swinger.

80 ton American 6 wheel Switching Locomotives. Btl. 1925.

315 ft. Ing. Rand 2 stage portable Diesel Compressor.

**Mississippi Valley Equipment Co.**  
515 Locust St. St. Louis 1, Mo.

## DIESELS

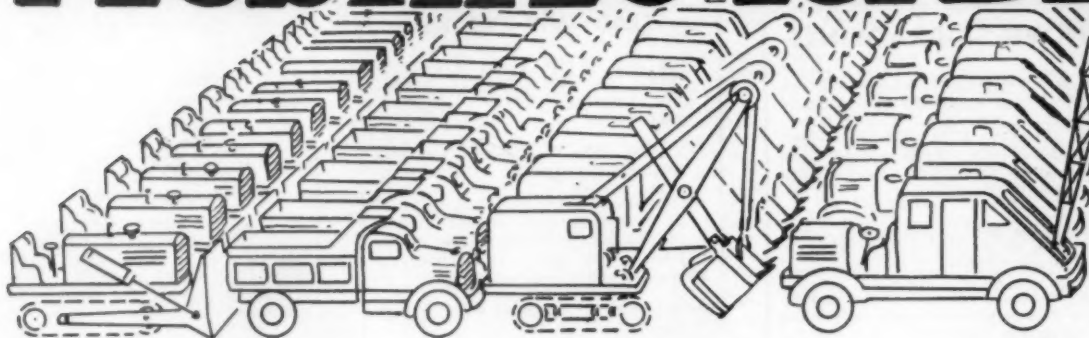
ALL SIZES, TYPES

**A. G. Schoonmaker Co.**

50 Church St. Phone Worth 2-0455  
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Business Established 1898.

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Like the Army Commander getting set for Invasion—the QUARRY MEN get their heavy equipment mobilized for extra heavy duty work.

And ECONOMY COMPANY works with him.

From all over the U. S. we have mobilized—for the ROCK PRODUCTS PRODUCERS—Power Shovels, Crawler Cranes, Draglines, Tractors, Scrapers and all the affiliated machinery, ready to tackle his job.

To get it started toward YOUR work—simply phone us for an inspection of any of the machinery listed below and we'll take care of the details at once. The machines, approved by you or your representative, will soon be on the cars or trailers rolling to your NEW JOB.

Read the partial listings below—then PHONE, WIRE or WRITE today.

## SMALL SHOVELS! GOOD SHOVELS! REAL BUYS!

- 2— $\frac{1}{2}$  yd. Bucyrus-Erie 10B Shovels: one in Pennsylvania—one in Kentucky. Shovel front, crane-boom and buckets.
- 1— $\frac{1}{2}$  yd. Bay City Model 30 Shovel and Crane. Rebuilt. New England.
- 1— $\frac{1}{2}$  yd. Byers Model 40 Shovel—8 wheel trailer. Good condition. \$3300.
- 1— $\frac{1}{2}$  yd. Insley K-16—built in 1938—Shovel-Backhoe-Crane Combination. W. Va.
- 1— $\frac{1}{2}$  yd. Hanson Shovel and Trailer. Pennsylvania.
- 1— $\frac{1}{2}$  yd. Universal Shovel— $\frac{1}{2}$  swing-Backhoe attachment. \$3100. New England.
- 2— $\frac{1}{2}$  yd. Byers Bearcat Combination. \$1280 each. New York.
- 1— $\frac{1}{2}$  yd. General Dragline. Indiana.
- 1— $\frac{1}{2}$  yd. Diesel General Dragline and Shovel Combination.
- 2— $\frac{1}{2}$  yd. Linkbelt Speeder Model B-3 Shovel and Dragline Combinations. One rebuilt guaranteed \$6300—other one good working condition. \$3300. New York.
- 1— $\frac{1}{2}$  yd. Lorain 36 Shovel and Dragline Combination. \$3900. Kentucky.
- 1— $\frac{1}{2}$  yd. P&H Model 390. A real buy. \$2350. New Jersey.
- 1— $\frac{1}{2}$  yd. P&H 300A Shovel and Crane Combination. \$5600. Illinois.
- 1— $\frac{1}{2}$  yd. Universal Model 35 Shovel and Crane Combination.

PHONE  
WIRE OR  
WRITE

## $\frac{3}{4}$ YD.-1940 • $\frac{3}{4}$ YD.-1939

2—Real  $\frac{3}{4}$  yd. Machines—one Koehring 302—built 1940—dragline boom and one P&H Model 255 Shovel and Dragline Combination. Both rebuilt and guaranteed. Excellent buys. Price—Ceiling.

- 1— $\frac{1}{2}$  yd. Bay City Model "B" Shovel-Backhoe Combination. Full swing. Very good condition. New England.
- 1— $\frac{1}{2}$  yd. Koehring Model 301—\$4900. Louisiana.
- 1— $\frac{1}{2}$  yd. Koehring Crane and Dragline. Rebuilt. \$7900.
- 1— $\frac{1}{2}$  yd. Lorain 49 Shovel and Backhoe Combination. \$6900. Pennsylvania.

## 2—LORAIN 40S

$\frac{3}{4}$  yd. Lorain 40 Dragline-Shovel Combination with buckets. Rebuilt Guaranteed. \$8,800. Colorado.  
 $\frac{3}{4}$  yd. Lorain 40 Shovel-Dragline and buckets. Built 1938. Condition good. Maine. \$8,300.

- 1— $\frac{1}{2}$  yd. Northwest Model 3 Shovel and Dragline. A real buy. \$6350. New York.
- 1— $\frac{1}{2}$  yd. Northwest 25 Backhoe Dragline. New England.
- 1— $\frac{1}{2}$  yd. P&H 400. Very good condition and very reasonable priced. New England.
- 1— $\frac{1}{2}$  yd. Bay City Model 45—diesel powered—built 1938.

- 2— $\frac{1}{2}$  yd. Bucyrus-Erie 20B—diesel—not recent models but still in good operating condition. \$5500 each.
- 2—1 yd. Lorain 55 Shovels—built 1936 or 1937. In good condition. Exceptional buys.
- 1— $\frac{1}{2}$  yd. Koehring 401 Dragline. In real good condition.
- 1—1 yd. Marion 440 Shovel.
- 1—1 yd. Marion 7 Shovel.
- 1—1 yd. Northwest 4 Shovel and Dragline. Rebuilt. New York.
- 3—1 yd. Northwest 105—one \$2300. One \$3400. One \$4900.
- 1—1 yd. Osgood shovel and dragline combination. \$6300.
- 1—1 yd. Caterpillar Diesel Osgood Shovel and Dragline Combination. Western location. \$8400.
- 1—1 yd. P&H Model 600 Shovel.
- 1— $\frac{1}{2}$  yd. Byers Master Shovel Dragline. \$7,400. Va.
- 1— $\frac{1}{2}$  yd. Lima Model 181 shovel dragline combination. Reasonably priced.
- 1— $\frac{1}{2}$  yd. Lorain 75 shovel. Good condition. \$8200. New England.
- 1— $\frac{1}{2}$  yd. Northwest Model 4 shovel and dragline. Southern location. Condition real good and priced very reasonably.

## A REAL BUY

1  $\frac{1}{4}$  yd. P&H Model 650 Shovel and Dragline. 50' Boom. Practically new dragline bucket. \$6,750. Maryland.

- 1—1  $\frac{1}{4}$  yd. Koehring Model 501 Shovel and Dragline. Condition good. Reasonably priced.
- 1—1  $\frac{1}{4}$  yd. Linkbelt K-2 shovel and dragline. 65' Boom. 1  $\frac{1}{4}$  yd. dragline bucket. \$1900. Ky.

## LORAIN 77

1939—1  $\frac{1}{2}$  yd. Lorain 77 in rebuilt guaranteed condition. Ready for immediate shipment.

- 1—1  $\frac{1}{2}$  yd. Northwest Model 6 Shovel Dragline Combination.
- 1—1  $\frac{1}{2}$  yd. P&H Model 700B Dragline, Pa.

## 2 YARD

Bucyrus-Erie 43B 2 yd. shovel.  
Model 701 Koehring—rated 1  $\frac{1}{2}$  yds. Shovel-Crane Pairings. A real bargain.  
Monaghan Dragline on Walkers—2 yd. Northwest Model 8—2 yd. shovel. Condition good. Price right.

# ECONOMY COMPANY INC.

NEW YORK

# Big Jobs with ECONOMY

## 1-3/4-YD. DIESEL

Looks like a new machine. Offered with a 60' boom—6-cylinder Atlas Diesel Engine. Two buckets. 30" pads. Long crawlers. This P&H 705 is ready for immediate shipment.

- 1-2 yd. Page Dragline.
- 1-2 yd. Bucyrus-Erie Diesel 50B Dragline Cummins Engine.
- 1-2 1/2 yd. Monaghan-Walker Dragline, 85' Boom.

## 2 1/2-YD. DIESEL SHOVEL & DRAGLINE COMBINATION

2—Exceptionally desirable 48B Bucyrus-Erie units. Complete shovel attachments—60' dragline boom—2 1/2 yd. dragline bucket—Buda 6-cylinder Diesel Engine. Will be loaded on cars. Price only \$21,400 each.

- 1-3 yd. Monaghan Diesel Dragline. Rebuilt from top to bottom. Brand new F.M. Diesel Engine. 110' aluminum boom. Ready for immediate shipment.
- 1-3 yd. Monaghan. Cummins Diesel Engine. 96' Boom.
- 1-3 yd. Marion Model 40A—90' Boom. Waukesha Diesel Engine.

## 2-2 1/2 DIESEL LINK-BELT DRAGLINES

One built in 1939 and the other in 1935. One has a brand new D-17000 Diesel Engine. Both have Speed-O-Matic Controls—High Gantries—33" crawlers and all other modern attachments. Both are exceptionally good buys.

## STEAM SHOVELS AND CRANES

- 8 yd. Bucyrus-Erie Class 250 Dragline—175' Boom. 6-8 yd. buckets. A real buy. Located Mississippi.
- 6 yd. Bucyrus-Erie Model 220B stripping shovel—80' shovel boom—34' dipper stick.

4 yd. Monaghan Dragline with 100' Boom. A real buy. \$7600.

3 1/2 yd. Marion Steam Shovel—65' Boom—40' Dipper Stick can be purchased for a fraction of its real value.

3 1/2 yd. 175B Bucyrus Shovel with 75' shovel boom, 48' Dipper Stick. \$20,000 has been spent on rebuilding the machine. A real buy for \$14,500.

## 4-YARD DIESEL

An exceptional opportunity of obtaining a 4 yd. 1940 Model P&H Diesel with 200 H.P.F.M. Diesel Engine. 36" pads—110' boom—4 cu. yd. dragline bucket. In perfect and guaranteed condition. Ready for immediate shipment. Phone if interested.

## TRUCKS

### 23-YD. DUMP TRUCKS

Sixteen—White Rear End Dump Trucks can be purchased extremely reasonable.

### 14-YD. "EARTH MOVERS" OSHKOSH TRACTOR WAGONS

We can offer three of these units in exceptionally good condition and reasonably priced. Two Euclid Diesel End Dump Trucks—10 to 12 yd. capacity.

Six—1941 and 1943 Euclid Diesel Dump Trucks of 10 to 12 yds.

Two—12 yd. International Dump Trucks.

Four Euclid Gas Bottom Dump Trucks—8 to 10 yds.

Five—8 to 11 yd. Euclid Diesel Bottom Dump Trucks.

Three—10 yd. Euclid Diesel Bottom Dump Trucks at an exceptionally low price.

Two—8 yd. Sterling Dump Trucks.

Four—5 yd. Sterling Dump Trucks.

Sixteen—International Dump Trucks 6-10 yd. capacity.

It is impossible to supply complete information regarding the above listed dump trucks and a great many others anywhere from 1 1/2 tons to 10 tons.

We suggest you write, wire or phone for detailed information, stating your requirements.

### 7-YD. BUCYRUS-ERIE 175B ELECTRIC SHOVEL

65' Shovel Boom—42' Dipper Stick. In good operating condition.

## 1943—5-YD. SHOVEL

This 5 yd. shovel was released from the factory in July, 1943, and, naturally, is in exceptionally good condition. The shovel boom is 34' long—the dipper stick 22'6". This machine is electrically driven and powered by Westinghouse Motors. Standard guarantee goes with the machine.

## TRACTORS

- 1-D8 Tractor with angledoser—Hyater Winch.
  - 1-D8 with Bulldozer and 12 yd. Scraper.
  - 1-D8 with LaPlante-Choate Hydraulic Bulldozer.
  - 2-D8—Serial in 80696, with 30 yd. Scrapers.
  - 1-RDT with LaPlante-Choate Hydraulic Bulldozer. Very good condition. Excellent buy.
  - 1-Model 11 Caterpillar Grader is for sale at a bargain price.
  - 1-D6 Caterpillar Tractor with Hydraulic Bulldozer.
  - 1-D4 Tractor—new in 1940.
- We have quite a selection of other Caterpillar, International, Cietrae and Allis-Chalmers Tractors. Write at once for detailed information.

## 4-YD. SHOVEL & DRAGLINE

100B Bucyrus combination shovel and dragline with 4 cu. yd. dipper bucket and 4 cu. yd. dragline bucket—105' dragline boom in four sections. Westinghouse Electric Motors. An exceptionally good buy for \$44,000.

## TRUCK CRANES

- 1—Lorain 40 specially constructed—15-18 tons—60' Boom.
  - 1—Orion Truck and Shovel Crane—10 wheeler. Excellent condition.
  - 1—1940 Bay City Crane on a six-wheeler chassis. 40' Boom.
  - 2—Universal Truck Cranes—10 large wheels. Real buy.
- In California we can offer one P&H Model 400; one Byers Model 10 and one Speeder Truck Crane. All on pneumatic tires. All rebuilt.
- 1—Diesel 12-15 tons Bay City Truck Cranes—60' Boom.
- Complete listing on other Truck Cranes will be gladly supplied.

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**ABRASIVE RESISTANT COVERS**

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

**TRANSMISSION BELTING**

HEAVY-DUTY FRICTION SURFACE		
Width	Ply	Width
18"	6	10"
16"	6	10"
14"	6	8"
12"	6	8"
12"	5	6"

Inquire For Prices - Mention Size and Lengths

**ENDLESS "V" BELTS**

"A" WIDTH All Sizes "D" WIDTH All Sizes  
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2 1/2"	50 feet	\$28.00
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1 1/2"	50 "	20.00
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**FOR SALE**

**MARION ELECTRIC  
DRAGLINE**

Type 125—Serial No. 6631  
80' Boom with 7 1/2 yd. Lightweight  
Bucket—Ward-Leonard Control.  
Located at Oakland, California

**HENRY J. KAISER COMPANY**  
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**CRUSHERS**

No. 5 and No. 6 Champion, jaw type,  
overhauled.

**SHOVEL**

1/4 yd., gas, 1/2 swing, Insley Type C,  
17' boom, 12'6" dipper stick. Also  
skimmer attachment. Rebuilt—very  
low price.

**THE INDUSTRIAL  
EQUIPMENT CORP.**

P. O. Box 1647, Pittsburgh 30, Pa.  
Warehouse: Carnegie, Pa.

**FOR SALE**

**FOR SALE**

2-300 Marion Steam Strip Shovels, 90', 56', 6 yd.  
2-202 Marion steam shovels, 5 yd.  
1-1400 P. & H. Elec. Dragline, 110', 4 yd.  
Model 37 Marion Elec. Dragline, 45' boom.  
Model 37 Marion Steam Shovel.  
76 Marion Stone Shovel, 3 1/2 yd.  
2 1/2-3 1/2-5 & 6 yd. dippers.  
2 yd. clamshell bucket.  
2-50 B Bucyrus steam shovels.  
Lot Cent. & Plunger Pumps.  
1 yd. Brownhoist Elec. Crane on cats, 55' boom,  
2 yd. Owen bucket.  
10-4 yd. Koppel Steel Side Dump Cars, 30' ga.  
Gasoline & Steam Locomotives, 30' ga.  
150 ton Buffalo R. R. Scale, 56 ft.  
18 1/2 ton Howe Truck Scale, 18', 90% new.  
20 ton Bonded scale, 24 ft.  
12 x 20" Champion Jaw Crusher.  
2-Bucket Elevators on chains, 45 ft.  
3-T. Monaghan Walking Dragline Diesel.  
Wantad: Shovels, Draglines, Bulldozers, Crushers,  
Etc.

**MCCARTNEY MACHINERY CO.**  
Box 35-SS, Youngstown, Ohio

**PRICED RIGHT!**

1-American Well Works 1000 gpm  
Cent. Pump, 2 stage, 125 lb. with  
Westinghouse 150 HP AC motor.  
1-Vulcan 6'x42' Rotary Dryer, 1/2"  
shell, located West Coast.  
1-Christie 80'x48' Rotary Dryer, 5/8"  
shell.  
1-Vulcan 6'x60' Rotary Kiln.  
1-Set of 18"x10" Crushing Rolls.  
1-Blake Jaw Crusher, 9"x15".  
5-Oliver Rotary Filters, 8'x10', 6'x6',  
5'x8', 3'x2'.  
2-Bucket Elevators 20' to 75'.  
8-Belt Conveyors 20' to 50'.  
5-Tyler Screens 3'x5', 4'x5'.  
1-Hardinge 6'x4' Conical Pebble Mill,  
30 HP motor.  
2-Dorr 15' Bowl Classifiers.

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225 WEST 34th STREET, NEW YORK 1, N. Y.

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1 Williams No. 6 Jumbo Hammermill.  
1 Asphalt Travel Plant, 50 to 75 tons per hour.  
1 WKC-3 Hercules gasoline motor.  
1 Monarch 75 Caterpillar Tractor with power take-  
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36" x 48" JEFFREY—2 Roll  
Completely Rebuilt  
New shells, new bearings, etc.  
For friable materials, coal, etc.

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**JOS. GREENSPON'S SON PIPE CORP.**  
Natl. Stock Yds., St. Clair Co., Ill.

## FOR SALE

### AVAILABLE IMMEDIATELY

COMPLETE GRAVEL CRUSHING AND WASHING PLANT OR CRUSHED ROCK SCREENING PLANT (SEMI-PORTABLE).

Principal equipment consists of:

1. 20" x 36" ROLLER BEARING CRUSHER.
2. 3" x 12" ROLLER BEARING SCALPER SCREEN.
3. 3' SYMMONS CONE REDUCTION CRUSHER.
4. 4' x 16' TRIPLE DECK ROLLER BEARING SIZING SCREEN.
5. 36" x 27" SAND DEHYDRATOR.
6. STORAGE BINS FOR 40 TONS OF FINISHED MATERIAL.
7. 6" 3-STAGE WATER PUMP.
8. ALL NECESSARY CONVEYORS, ALL 24" BELTS.
9. ALL ELECTRIC MOTORS, TOGETHER WITH V-BELT DRIVES.

This equipment is the equivalent of new for operating purposes. It is adapted to operate either with its 3-stage pump for a washed product, consisting of sand and three sizes of rock.

If crushed ledge rock is used it may be operated as a dry plant.

If road gravel is desired, it may also be operated as a dry plant.

It is a very satisfactory plant for use in making screened railroad ballast.

Our proposition is to rent this equipment on any reasonable length contracts to net us 10% a month on our investment, or to contract your requirements for finished material to your specifications.

We have two of these plants such as above which were developed for war work and they are both surplus in this territory at the present time.

Write Box C-40, c/o Rock Products, 300 W. Jackson Blvd., Chicago 6, Ill.

## LOCOMOTIVES SHOVELS CRANES CARS

- 1-42½ ton Porter 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, entire new firebox, rebuilt.
- 1-26 ton American 0-4-0 saddle tank locomotive, standard gauge, A.S.M.E. boiler, thoroughly overhauled.
- 1-72½ ton Baldwin 0-6-0 separate tender switcher, full time I.I.C. papers, overhauled.

- 1-Whitcomb diesel locomotive, 36" gauge, with Caterpillar V-8 engine, air brakes, electric lights. This locomotive built in 1936 and has now been put in first class serviceable condition with new wheels, chains, sprockets, reversing gear, and bronze clutch plates. Weight is 30 tons in full working order.

- 5-Western 30 yard two way air operated slide dump cars, standard gauge. DROP DOOR TYPE, first class condition.

**Birmingham Rail & Locomotive Co.**  
BIRMINGHAM 1, ALABAMA

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#### IMMEDIATE SHIPMENT

Five Allis-Chalmers tube mills 5'x22", chilled iron liners, steel heads, good condition.

#### KOSMOS PORTLAND CEMENT CO.

1529 Starks Bldg.

Louisville 2, Kentucky

### FOR SALE

- 1-200 H.P. Allis-Chalmers Motor, 550 R.P.M., 440 V. 3 P., 60 C.
- 1-250 H.P. Westinghouse Motor 575 R.P.M. Induction Type, 220 V.
- 1-150 H.P. Westinghouse Motor.
- 1-225 H.P. Allis-Chalmers Motor, 550 R.P.M., 2200 Volts.
- 1-Westinghouse Steam Turbine to 375 K.V.A. 2200 Volts Generator.
- 1-350 H.P. G. E. Induction Motor, 220 Volts.
- 1-200 H.P. G. E. Motor, 600 R.P.M., 440 Volts.
- 1-5 Ft. Radial Drill.
- 1-4 Ft. Radial Drill.
- 1-Planer 25'x8'x36" Travel.
- 1-6" Georgia Iron Works Pump and Motor.

**W. M. SMITH & COMPANY**  
P. O. Drawer 1711  
BIRMINGHAM 1, ALABAMA

### LIKE NEW!

Only 90 Days in Operation . . .

- 1-Dixie Hammermill 36" in Dia., 50" Wide, Serial No. 1832 shipped 4/24/44, F.O.B., St. Louis.
- 1-Complete set of hammers, "new."
- 1-V-belt drive 720 R.P.M. to 1200 R.P.M. and spare sheave to drive mill, 1490 R.P.M.
- 1-Set spare belts D-195.

Write Box C-28,  
c/o Rock Products,  
300 W. Jackson Blvd., Chicago 6, Ill.

- 15-ton Industrial locomotive cranes, GAS.
- 1½-yd. Owen type K, rehandling bucket.
- 18-ton Plymouth gas locomotive, std. gas.
- ¾ yd., Northwest 105 crawler crane, gas.

Try us for other equipment too.

**ALLSTATES EQUIPMENT CO.**  
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Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your inquiries.

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600 12-inch cast iron pallets to fit Stearns machine. Will also swap for other size pallets for Stearns machine.

**BATTLE CREEK CONCRETE PRODUCTS CO.**  
Reese Road, Battle Creek, Mich.

### AIR COMPRESSORS

BELTED: 255, 525, 675, 1000, 1500 & 1570 Ft. ELECTRIC: 475, 675, 897, 1305, 1725 & 2300 Ft. DIESEL: 605, 897 & 1000 Ft. PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft. STEAM: 40, 510, 525, 1500, 2200 & 3600 Ft. CLAMSHELL BUCKETS, SKIPS & GRAPPLERS Owen B & H Stone Grappler. 3 Yd. OWEN Type S Material Handling. 1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class K. 18 Steel Skips 6½ x 2 x 2½. 5 Ton Bucyrus Rock Grabs.

### CRANES AND DRAGLINES

1-18 Yd. 160' Boom Electric Caterpillar Drag-line. ¾ Yd. 5 Ton O & S 30 Ft. Boom. 12 Ton NORTHWEST 50 Ft. Boom Gas. 20 Ton LIMA, 750 Diesel, 65 Ft. Boom. 25 Ton BROWNING & 30 Ton AMERICAN Loco. 25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

### CATERPILLAR SHOVELS

2 Yd. Marion Steam Shovel. ¾ Yd. 1½ Yd., 3 Yd. & 4 Yd. MARION Electric. 1 Yd. NORTHWEST Gas. 1½ Yd. LIMA Diesel. 1½ Yd. BUCYRUS 41B Steamer. 6 Yd. Bucyrus 1200B Electric. Also 3 yd. Erie Elec. 5 Yd. P & H Model 1500 Elec.

### DUMP CARS

40-KOPPEL, 1½ Yd. 24 & 30 In. Ga., V Shaped. 15-2 Yd., 3 Yd., 4 Yd., 6 Yd., 12 Yd., 36 In. Ga. 20-Std. Ga. 12 Yd., 18 Yd., 24 Yd., 30 Yd. Cap. 15-Std. Ga. 50 Ton Battleshield Gondolas.

### BOX, FLAT & TANK CARS

0-50 ton std. ga. heavy duty flat cars. 30-8000 gal. cap. tank cars. 30-40 ton std. ga. box cars.

### HOISTING ENGINES

Gas: 15, 30, 60, 100 & 120 HP. Electric: 30, 50, 80, 100 & 150 HP. Steam: 6½x8, 7x10, 8½x10, 10x12, 12x24.

### DIESEL UNITS

75, 90, 150, 200 HP. F. M. Engines. 175 KVA Worthington 3/60/2300. 275 KVA Fairbanks 3/60/2500. 343 KW. Fairbanks-Morse 3/60/480 V.

### BALL, ROD AND TUBE MILLS

5'x22" HARDING CON. Dry Ball Mill. 6'x22" HARDING CONICAL Pebble Mill. 8'x22" HARDING CONICAL Ball or Pebble Mill. 4x8, 6x6 & 10x9 Straight Ball Mills. 4x16, 5x18 & 5x22 Tube Mills & 6'x22". 3½x9 & 5x7 Air Sweep Tube Mills. 2x½, 6x12 & 8x12 ROD MILLS.

### PULVERIZERS

JEFFERY, 24x20 & No. 1 Sturtevant Ring Roll. RAYMOND Auto Pulverizer No. 0000, 0 & 3. 10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

### SEPARATORS AND COLLECTORS

8, 10 and 14 ft. Separators, Garco & Bradley.

### ROLL CRUSHERS

36x60 Fairmont & 36x20 Diamond.

### JAW CRUSHERS

10x8, 13x7½, 14½, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 30x12, 36x12, 36x15, 30x13, 36x15, 36x30, 36x18, 36x14, 36x9, 36x6, 36x10, 36x24, 42x9, 48x24, 48x36, 60x24, 84x26, 36x16, 8x36.

### CONE & GYRATORY CRUSHERS

5 No. 19, 25, 37 & 49 Kennedy. 18 in. 24 in., 30 in., 36 in. & 48 in. Symons Disc. 4-10 T2 Traylor 4 ft. Gyratory. 4-No. 5, 3 & 6 Austin Gyratory. 2-Traylor T-13 Bulldog Gyratory, also 16 inch 8 in. Traylor T. Gyratory. 17 Gates K-No. 2, 4, 5, 6, 7½, 9, 9½ & 21. 7-Symons Cone, 2, 3, 5½ & 7 ft. 6, 10 & 12 inch Superior McCullys.

### CONVEYOR PARTS

BELT: 1000 Ft. 60 in., 700 Ft. 40 in., 600 Ft. 36 in., 800 Ft. 30 in., 1643 Ft. 24 in., 317 Ft. 20 in., 297 Ft. 18 in., 500 Ft. 16 in., 500 Ft. 14 in. IDLERS: 54 in., 48 in., 36 in., 30 in., 24 in., 20 in., 18 in., 16 in. & 14 in. Head & Tail-Pulleys-Takeup for all sizes. Steel Frames: 2,000 Ft. 24 in., 30 in. & 36 in. Sections.

### ROTARY DRYERS AND KILNS

36 in.x20 Ft., 3 Ft.x20 Ft., 4 Ft.x20 Ft., 54 in.x30 Ft., 48 in.x24 Ft., 5 Ft.x20 Ft., 5 Ft.x16 Ft., 5 Ft.x60 Ft., 6 Ft.x60 Ft., 6 Ft.x20 Ft., 6 Ft.x70 Ft., 10x20, 7½x100 & 8x110 Ft. Kilns.

### STEEL DERRICKS

GUY: 5 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 160 Ft. Boom. STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

### LOCOMOTIVES

GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14, and 30 Ton. STEAM: 2 Ton, 30 Ton, 40 Ton, 60 Ton & 80 Ton. ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton. DIESEL: 4, 8 & 15 Ton.

### SCREENS

VIBRATING: 2x4, 3x6, 12x8, 3x5, 3x5, 4x5, 4x5, 4x10, 48x72, & 48x12. 1, 2 & 3 Deck. HUMMER ROTEX, NIAGARA & ROBIN. REVOLVING: 3x19, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x32, 4x34, 5x30, 5x20, 6x30.

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**EQUIPMENT CORPORATION of AMERICA.**

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# AGRICULTURAL LIMESTONE

Quarry Property for Sale or Lease

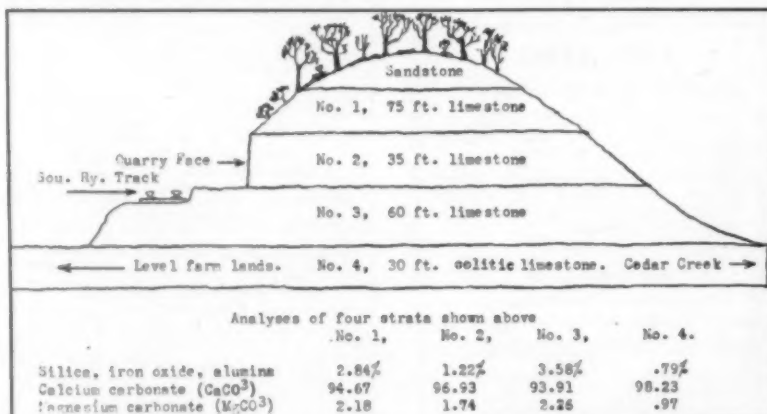
**IDEAL LOCATION** For Profitable Plant Operation



Where Southern Railway crosses quarry property.



Part of the quarry face.



The limestone quarry shown here contains an excellent quality of stone and is in a fine location for a profitable operation.

It is located at Isbell, Ala., on the Southern Railway, in Franklin County, just 25 miles from Wilson Dam on Tennessee River, and 100 miles north of Birmingham. There are two grades of limestone, both very pure, 95% calcium carbonate.

The quarry floor is oolitic limestone, soft and white, suitable for building stone. The quarry face is somewhat harder, but crushes easily, and has been used for road building for several hundred miles in all directions. It contains no flint or other impurities, and is especially good for agricultural limestone.

There is no quarry making agricultural lime closer than Birmingham and Huntsville, Ala. There is no limestone whatever in the Counties of Marion, Winston, Walker and Fayette, just south of Franklin. There is no limestone in Mississippi, where farms are now getting large amounts of agricultural limestone from Illinois.

A crusher located on the quarry floor, as shown above, would run the agstone into railroad cars or trucks by gravity, the R.R. switch being less than 100 feet away. TVA electric power is at hand.

This quarry is for sale, or for lease on a royalty of two cents per ton. Agstone can be produced for 90 cents per ton, and freight rates are about one cent per ton mile, the rate to Columbus, Miss., being 1.30, and to Meridian, Miss., 1.60 per ton.

The AAA (War Food Administration) advise that they can use a large part of the output. Now is the time to get ready for these 1946 orders.

For further information, write to:

**W. H. ISBELL, Owner**

225 Broadway

New York, N. Y.

## QUALITY

### OVERHAULED EQUIPMENT

All equipment listed is owned and overhauled by us in our modern, daylight shop by experienced mechanics. 31 years' experience.

#### AIR COMPRESSORS

2—Ingersoll-Rand 315 2-stage, gas, portable.

#### BUCKETS

5— $\frac{1}{2}$ -yard to 1 $\frac{1}{2}$ -yard Owen and Blaw-Knox general purpose and rehandling.

#### CRANES, SHOVELS

P & M 1 $\frac{1}{2}$ -yd. Model 600 crane-shovel-dragline Byers Bearcat Jr., late model pullshovel-crane.

#### CRUSHERS & CRUSHING PLANTS

24x36 Teismith roller bearing jaw crusher, 1942 model, with extra set jaws, and 100 hp 3ph 60c 220/440v Westinghouse motor and V-belt drive.

Rock crushing plant, 15x38 roller bearing crusher, apron feeder, 42x24 roller bearing rolls, vibrating screen, conveyors, bin, with or without diesel power, 2-unit outfit.

12x24 Allis-Chalmers Improved Blake.

10x20 Good Roads.

Austin-Western Model 100 portable crushing plant, 9x40 and 4x40 roller bearing crushers, vibrating screen, gasoline power, sand rejector, conveyors.

#### DERRICKS

Clyde 10-ton guy derrick, 70' mast, 85' boom, like new.  
American 5-7 $\frac{1}{2}$  ton stiffleg derrick, 55', 77', or 97' boom.

#### LIME PULVERIZERS

Lippman 24x18 on wheels, bucket elevator.

#### LOCOMOTIVE

Milwaukee 6-ton.

#### POWER UNITS

4-75 to 140 hp Buda, Waukesha, & Wisconsin.

#### PUMPS

Jaeger Model 10PH, gasoline power.

Jaeger Model 6P.

#### SAND PUMPING OUTFIT

8" manganese pump on 34x36' barge, 500' 8" pipe fittings and floats, electric power.

### BOEHCK CONSTRUCTION EQUIP. CO. EQUIP. CORP.

2402 W. Clybourn St.  
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LOCOMOTIVE, Lima 80 ton, 6 wheel switches, National Board Boiler, 200 lbs. pressure, thoroughly modern, guaranteed condition, for sale or rent.

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Modern equipment of all kinds for contractors, quarries, etc.

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Chicago NSB air compressor, 14"x12", 529 CFM.  
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GYREX double deck 4'x10' vibrating screen.  
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Buchanan 14"x36" C double roll crusher.  
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Traylor "BULLDOG" 11" gyratory crusher.  
Sturtevant No. 2 Rotary Fine Crusher.  
Midwest No. 2 hammermill.  
Robins double roll coal crusher, 24"x30".  
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Simplex coal pulverizer, roller bearings.  
8 tons steel crushing balls, 1" to 2".  
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Bucket elevators, 10", 15", 20" on chain and belt.  
50' elevator, 12" malleable buckets on belt.  
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Buchanan Type B 12"x36" Jaw Crusher.

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One St. Louis 8" x 12" Jaw Crusher, \$510.00.

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1—Size 1020 Good Roads portable, crusher Champion, size 10x20", 26' bucket elevator, revolving screen, 30-ton hopper, gasoline powered.

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

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1—No. 3 Champion jaw crusher, size 7x13".  
1—United Iron Works, "Blake-type" jaw crusher, size 9x12".  
1—No. 9 New Holland jaw crusher, size 6x12".  
1—Sawyer Massey jaw crusher, size 9x12".  
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Lorain 75A Shovel and Crane, 1½ yds.  
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Complete Rock Crushing, Sand and Gravel Plants.

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- 1 Used Anchor Stripper Block Machine.
- 1 New Holland 15' vertical elevator.
- 53' Elevator Casing.

New Holland Concrete Products  
New Holland, Pennsylvania

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1 Champion Besser Tamper Block Machine, 1941 model, complete with attachments for 3, 4, 6, 8, and 12 inch blocks 18" long.  
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All of this equipment is in good shape, ready to go to work. Price \$2300 at our plant.

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Selling Price, \$300 Per Car.

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6-50-KVA and 3-75-KVA 7200 primary, 480 secondary, 25 cycle Transformers.

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For delivery to West Coast.

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By leading producer crushed limestone located middle west. Product serves the chemical, metallurgical and construction industries. Excellent post war prospects.

Applicant must have broad experience and training in production and be capable of the direct supervision of all operations including maintenance of an organization for plant producing in excess of million tons annually.

Give complete history in first letter: age, education, family, experience by years, when available, references. References will not be contacted until after interview.

Write Box C-41, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

### WANTED

#### MILL SUPERINTENDENT

Experienced man to operate lime and stone department in Eastern lime plant. 50 employees. Reply stating experience, age, education, expected salary. Submit photo (not to be returned.) Write Box C-39 c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

### DUST COLLECTING ENGINEER

Dust Collecting salesman for wood, shoe-making and foundry plants, etc. Must have experience in designing and layout, also knowledge of fan engineering. Write Box C-37, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

### WANTED PLANT SUPERINTENDENT

Familiar with pipe, block or any special concrete product. Must have at least high school education, be mechanically inclined and have pleasing personality. Age limit 48. Post-war opportunity with large concern branching out into full line of products in various sections of the United States and operating on an incentive profit sharing plan. Past record must stand rigid inspection. Include photograph in reply. Write Box C-15, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

## POSITIONS WANTED

### POSITION WANTED

Experienced graduate chemist desires position of a supervisory nature in firm with good opportunity for advancement. Several years' experience as chief chemist of large steel laboratory and assistant chief chemist for cement company. Available in 30 days. Age 30, family, references. Write Box C-42, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED — Assistant Chief Chemist in one of the most up-to-date plants in the country desires position of a supervisory nature in firm with good opportunity for advancement. Eighteen years of experience in cement manufacture. Recently released from the Army under the Voluntary Retirement plan with rank of major. Two-and-one-half years of the three-and-one-half in the Army were in technical research and plant management. Write Box C-16, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

POSITION WANTED by cement chemist, college education, 20 years' experience in the industry with all A. S. T. M. plus Oil Well and Pozzolanic cements. Employed at present but desire a change. Write Box C-33, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.



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These spreaders can now be purchased without priority or certificates of any kind. Write us for any additional information, also prices.

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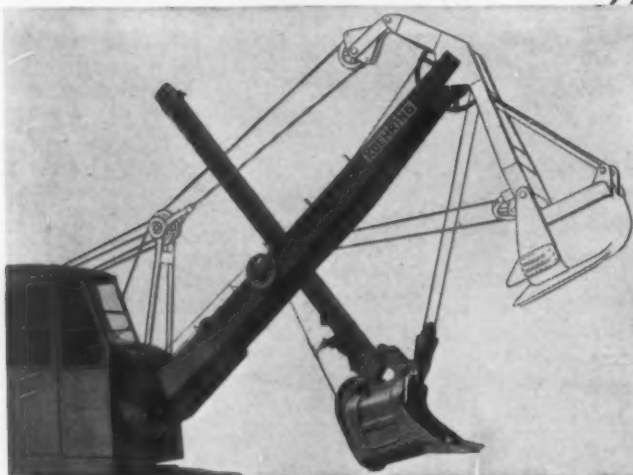
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